Original Articles
4 5-2-1—Almost None: Parents’ Perceptions of Changing Health-Related Behaviors in Their Obese Child
10 Using Implementation and Dissemination Concepts to Spread 21st-Century Well-Child Care at a Health Maintenance Organization
19 Use of a Computerized-Medical Database and Reminder Letters to Increase Preventive Care Use in Kaiser Permanente Patients
25 Reducing Newborn Office Visits and Improving Satisfaction Through Parent Education and Learning Communities
31 Nursing Responses to Transcultural Encounters: What Nurses Draw on When Faced with a Patient from Another Culture

Review Article
38 Laparoscopic Repair of Incisional and Other Complex Abdominal Wall Hernias

Case Study
43 Successful Treatment with Intravenous Immunoglobulin of Acute Flaccid Paralysis Caused by West Nile Virus

Clinical Medicine
48 Acute Phosphate Nephropathy
51 The Importance of Accurate Blood Pressure Measurement

Commentary
55 East Asian Attitudes toward Death—A Search for the Ways to Help East Asian Elderly Dying in Contemporary America
84 Interview with Lawrence Weed, MD—The Father of the Problem-Oriented Medical Record Looks Ahead
Pattie Palmer-Baker, a Kaiser Permanente patient, was recently diagnosed with Atrial Flutter. Ms Palmer-Baker put her in touch with powerful feelings about the disorder and about suffering, aging, and death, which she has tried to express in this piece. Ms Palmer-Baker's work includes calligraphy, collage, and original poetry. In this piece, the poetry, in calligraphic form, meanders around the edges of the work making a visual statement while conveying her thoughts and feelings. The collage is made up of images and designs cut from paste paper. Ms Palmer-Baker states that the integration of the elements—poetry, calligraphy, and collage—creates an image that is greater than the sum of its parts.

Ms Palmer-Baker's artwork includes paste paper collage (22” x 32”) by Pattie Palmer-Baker, “Diagnosis: Atrial Flutter” and “Atrial Flutter put her in touch with powerful feelings about the disorder and about suffering, aging, and death, which she has tried to express in this piece. Ms Palmer-Baker's work includes calligraphy, collage, and original poetry. In this piece, the poetry, in calligraphic form, meanders around the edges of the work making a visual statement while conveying her thoughts and feelings. The collage is made up of images and designs cut from paste paper. Ms Palmer-Baker states that the integration of the elements—poetry, calligraphy, and collage—creates an image that is greater than the sum of its parts.

On the cover:
"Diagnosis: Atrial Flutter" a paste sugar collage (22” x 32”) by Pattie Palmer-Baker, a Kaiser Permanente patient in Portland, OR. Ms Palmer-Baker’s diagnosis of Atrial Flutter put her in touch with powerful feelings about the disorder and about suffering, aging, and death, which she has tried to express in this piece. Ms Palmer-Baker’s work includes calligraphy, collage, and original poetry. In this piece, the poetry, in calligraphic form, meanders around the edges of the work making a visual statement while conveying her thoughts and feelings. The collage is made up of images and designs cut from paste paper. Ms Palmer-Baker states that the integration of the elements—poetry, calligraphy, and collage—creates an image that is greater than the sum of its parts.

Ms Palmer-Baker's artwork includes paste paper collage (22” x 32”) by Pattie Palmer-Baker, “Diagnosis: Atrial Flutter” and “Atrial Flutter put her in touch with powerful feelings about the disorder and about suffering, aging, and death, which she has tried to express in this piece. Ms Palmer-Baker's work includes calligraphy, collage, and original poetry. In this piece, the poetry, in calligraphic form, meanders around the edges of the work making a visual statement while conveying her thoughts and feelings. The collage is made up of images and designs cut from paste paper. Ms Palmer-Baker states that the integration of the elements—poetry, calligraphy, and collage—creates an image that is greater than the sum of its parts.

Ms Palmer-Baker’s work includes calligraphy, collage, and original poetry. In this piece, the poetry, in calligraphic form, meanders around the edges of the work making a visual statement while conveying her thoughts and feelings. The collage is made up of images and designs cut from paste paper. Ms Palmer-Baker states that the integration of the elements—poetry, calligraphy, and collage—creates an image that is greater than the sum of its parts.
**CLINICAL MEDICINE**

47 Image Diagnosis: Abnormal Plain Films from the Emergency Department. Gus M Garrels, MD, FACEP, FFAEM

In image 1, acute epiglottitis looks like a thumbprint at the level of the hyoid bone. Although now relatively rare in children, it can occur in adults and remains an airway emergency. In image 2, free air under both hemidiaphragms is an ominous sign. Although it may be present in postoperative patients and has been reported following vigorous sexual activities.

**Corridor Consult**

48 Acute Phosphate Nephropathy. Antoine Abcar, MD; Aviv Hever, MD; Jasminde S Momi, MD; John J Sim, MD

The risk for acute phosphate nephropathy is increased in patients with underlying chronic kidney disease, older age, and female sex; in patients taking angiotensin-converting enzyme inhibitors, angiotensin-receptor blockers, diuretics, nonsteroidal anti-inflammatory drugs, and after exposure to sodium-phosphate bowel-cleansing solutions.

51 The Importance of Accurate Blood Pressure Measurement. Joel Handler, MD

The most important commonly performed office test is blood pressure measurement, yet it is considerably undervalued. Populationwide, small inaccuracies in blood pressure measurement can have considerable consequences. Overestimating true blood pressure by 5 mm Hg would lead to inappropriate treatment with antihypertension medication in almost 30 million Americans, with attendant exposure to adverse drug effects, the psychological effects of misdiagnosis, and unnecessary cost.

**COMMENTARY**

55 East Asian Attitudes toward Death—A Search for the Ways to Help East Asian Elderly Dying in Contemporary America. Sok K Lee, MD, MA

Most people in the West and the East wish to die at home; however, about 50% of Americans die in acute care hospitals. For better care of the dying elderly, this article is written to help American physicians understand the unique aspects of East Asian Confucian Ethics—the relational autonomy of family, Confucian creative self-transformation, and the unity of transcendence and the human being.

61 SERVE Ethiopia. Philip J Tuso, MD, FACP

The incidence of chronic kidney disease in Ethiopia is rising because of high blood pressure and diabetes mellitus; End Stage Renal Disease remains mostly fatal. Treatment considered the norm in industrialized countries is limited in Africa—dialysis is dependent on the availability of funding and charitable contributions; few governments cover the cost of renal replacement therapy.

65 The World Health Organization’s Evidenced-Based Approach to Chronic Diseases: Primary Prevention or Caring for End-Stage Disease? Tom Judd, MS, PE, CCE, CPHQ, FACEC

Several hundred evidence-based (EB), national and global Clinical Practice Guidelines have been mapped by the World Health Organization (WHO) in the past ten years, allowing simulation and analysis of the health services’ resource requirements of various countries. This approach reflects a balance between primary prevention interventions (eg, as demonstrated for hypertension and diabetes) and investing in ongoing EB Medicine treatment. Examples are cited from personal experience with WHO initiatives in Kyrgyzstan and Mexico.

69 The Perfect System. George Halvorson

Health care needs and deserves the perfect computer system. Here are ten criteria, detailed in a chapter from Health Care Will Not Reform Itself, for that ultimate American health care database system design: 1) patient focused, 2) complete, 3) accessible by all relevant parties, 4) current, 5) easy to use, 6) linked to care improvement programs, 7) accessible to patients as well as caregivers, 8) transportable, 9) interoperable, 10) confidential.

**QUALITATIVE CASE STUDY**

77 Responding to the Language Challenge: Kaiser Permanente’s Approach. Kate Meyers, MPP; Gayle Tang, MSN, RN; Alicia Fernandez, MD

A qualitative case study of the Kaiser Permanente San Francisco Medical Center’s approach to developing linguistic access services and subsequent organizationwide initiatives: language-specific care modules focused on Chinese-and Spanish-speaking patients, a centralized Multicultural Services Center, improving interpreter services, optimizing use of bilingual staff, and creating a translation infrastructure.

**EDITORIALS**

84 Interview with Lawrence Weed, MD—The Father of the Problem-Oriented Medical Record Looks Ahead. Lee Jacobs, MD

During this interview, Dr. Weed describes his electronic tool for applying medical knowledge to patient data—“coupling”—to aid the accuracy and completeness of diagnostics and treatment. In addition, he describes his view of the failing of the current medical education system, which fosters a misplaced faith in the efficacy of a physician’s intellect.

90 Biostatistics 101: Understanding Data. David Ezioni, MD, MSHS; Maher A Abbas, MD, FACS, FASCRS

Research studies can generate complex data and results that require analysis to demonstrate the effect of therapies and interventions, to establish the efficacy or limitation of treatments, and to prove or to refute a scientific hypothesis. An understanding of biostatistics is critical to the researcher investigating clinical questions. Equally important is an appreciation of statistics by the reader and interpreter of published studies. This article, the first of a three-part series on statistics for clinicians, notes—types of data: quantitative (continuous or discrete) and qualitative (ordered or discrete); and describes data as measurements of the center and the distribution.
Abstract

Objective: Recent clinical pediatric practice guidelines reiterate the importance of key messages to prevent childhood overweight and obesity, including the consumption of at least five servings of fruits or vegetables each day, a limit to screen time (time spent watching TV, using a computer, and playing video games) of two hours or less per day, engagement in at least one hour of physical activity per day, and the consumption of no sugary beverages each day. The perceptions of primary caregivers of obese children of these key messages are less clear. We explored parents’ (or caregivers’) awareness of and confidence in adopting a variation of the expert committee’s recommended (5-2-1–Almost None [AN]) behaviors.

Materials and Methods: Before the initiation of treatment, parents of obese children completed a survey designed to explore their awareness of and confidence in adopting 5-2-1–AN behaviors. Qualitative and quantitative analyses were conducted to assess how aware these families are of 5-2-1–AN behaviors and how confident they would be of their ability to guide adoption of these specific behaviors.

Results: Parents from 193 families indicated that weight management depends substantially on physical activity (63%). However, parents rated as less important consuming fruits and vegetables (17%), controlling portions (13%), eliminating sugary drinks (4%), reducing screen time (3%), eating breakfast each morning (1%), and having family dinners (1%). Almost universally, respondents reported significantly reduced confidence in helping their child adopt nonspecific lifestyle changes in eating and physical activity versus the targeted behaviors identified in 5-2-1–AN.

Conclusion: Parents surveyed for this clinical study readily accept certain aspects of the 5-2-1–AN message as factors in healthy living. Despite low levels of reported awareness of the message, the consumption of almost no sugary drinks was the only actionable behavior in the 5-2-1–AN message that parents felt significantly more confident they could achieve than the nonspecific goal of improved eating. These perceptions can be used to help guide the adoption of 5-2-1–AN strategies as well as help clinicians target messages for specific healthy behavior adoption.

5-2-1–Almost None: Parents’ Perceptions of Changing Health-Related Behaviors in Their Obese Child

Michael Campbell, PhD, LCSW
Jane M Benton, MD
Lloyd N Werk, MD, MPH

Introduction

One of the most daunting issues facing parents today is the deleterious effect of excess body weight on their children. According to the Centers for Disease Control and Prevention (CDC), between 14% and 19% of children and adolescents in the US are overweight. A similar trend was noted in younger children, with 10% of children between the ages of 2 and 5 years and 15% of children between the ages of 6 and 11 years being obese (body mass index ≥ 95th percentile). Florida is no stranger to this problem, with state percentages of obese children equal to or greater than national averages. Consistent with the rest of Florida, Orlando’s youth are seriously affected by the childhood epidemic of obesity. Further, more than one-quarter of Florida’s children are at risk to become or are already clinically overweight. Early intervention is vital because overweight and obese children are at an increased risk for adult obesity, heart disease, hypertension, diabetes, gallbladder disease, and some cancers.

Recently, an expert committee convened by the American Medical Association, in collaboration with the
Department of Health and Human Services’ Health Resources and Service Administration and the CDC, produced a series of recommendations regarding the prevention, assessment, and treatment of childhood and adolescent overweight and obesity. The committee found consistent evidence to support targeted behaviors that contribute to a healthy lifestyle. Four specific target behaviors are readily actionable and contribute to better management of the energy equation (caloric energy intake versus energy expended). These key target behaviors consist of consuming at least five servings of fruits or vegetables each day, limiting screen time (TV, computer, and video games) to two hours or less per day, engaging in at least one hour of physical activity per day, and consuming no sugary beverages each day. The 5-2-1-0 messaging has been adopted widely in regional initiatives, either directly or in a slightly modified form (eg, 5-2-1–Almost None [5-2-1–AN]; www.growuphealthy.com). A survey conducted within a pediatric obesity interest group found that 5-2-1-0 messages or a slight variant are being used in 40% of US regional social marketing campaigns.

Through the efforts of Nemours Health and Prevention Services, these targeted behaviors are packaged into the 5-2-1–AN message that Nemours’ clinicians and child advocates use to drive policy advocacy initiatives as well as contribute to pediatric weight management in practice. Weight management, as with other healthy lifestyle behaviors, has presented a considerable challenge to traditional medical intervention strategies. The 5-2-1–AN message is tailored to help children and their parents and caregivers better understand concrete ways to live a healthy life. Parents play a key role in facilitating weight control through role modeling, limit setting, and supportive encouragement. It is hypothesized that by using 5-2-1–AN as a guide for healthy living, parents have clear direction for actionable behaviors and thus are better positioned to partner with their child and the health care team to negotiate strategies for weight control.

**Clinical Setting**

Children seen in the Nemours Healthy Choices Clinic (HCC) receive care from a multidisciplinary team of pediatric specialists and allied health professionals who provide evidence-based care and are child and family focused. The comprehensive medical, nutritional, and psychosocial evaluation and treatment of these children requires a team approach that promotes the 5-2-1–AN message. Interdisciplinary collaboration among health care professionals allows each member to contribute to the care of specific patients. A key element in this collaboration is coordination of care among clinicians, resulting in greater efficiency and better clinical outcomes.

Anchored by the 5-2-1–AN message, the HCC model of shared care involves a core health care team working in partnership with the patient and the patient’s family to identify opportunities for healthy weight management and to navigate needs and barriers to adopting new behaviors. The shared-care model allows enhanced information exchange beyond routing of notes, adoption of systematic evaluation and treatment, improved patient service, and reduced or eliminated multiple appointments at different sites to improve patient outcomes and satisfaction, as indicated in prior research.

**Research Design and Methods**

We surveyed primary caregivers of obese children regarding their awareness of and confidence in adopting a variation of the expert committee’s recommended (5-2-1–AN) behaviors. A convenience sample was chosen of parents from a cohort of racially and ethnically diverse families who came to the HCC between August 2006 and December 2007. Parents completed the survey, adapted from Miller and Rollnick’s model (which explores respondents’ views regarding the importance of adopting healthy lifestyle behaviors, their confidence in their ability to adopt them, and their readiness to do so), and then returned them before the initiation of treatment.

The survey involved both qualitative and quantitative data items. The qualitative survey data was analyzed by categorically ranking healthy lifestyle themes to assess the frequency with which parents identified 5-2-1–AN variables as a component of healthy living. A coding sheet was developed identifying 5-2-1–AN constructs as well as three other weight-control themes that are featured prominently in the literature (controlling portions, eating breakfast, and eating family meals). The surveys were coded by two independent reviewers and kappa (K) statistic analyses were run to assess their interrater reliability.

Quantitative survey data were examined using SPSS (version 14.0, SPSS Inc, Chicago, IL, USA) cross-tabulation analysis to assess respondents’ confidence in their ability to make changes with nonspecific goals of healthier eating and engaging in healthier physical
activity and their confidence in their ability to adopt specific 5-2-1–AN behaviors. Scales were created comparing the “top box,” or highest, responses (5) with the combined scores of all others (4 to 1), with scores recoded to allow for comparison. As indicated by market research, the likelihood of engaging in a behavior (buying and brand loyalty) is closely influenced by a reported top box score. Associations between global goal change and 5-2-1–AN variables was assessed using χ² analysis.

**Results**

A total of 193 parents fully completed surveys. Nine surveys met exclusion criteria based on lack of completeness (more than 10% of items unanswered); the excluded families were found to have similar baseline characteristics to those enrolled in the study sample. Of their children, 51% were girls. This ethnically and economically diverse group of children had a mean age of 11.3 ± 3.1 years and mean body mass index that put them in the 99th percentile (± 1.03%) for their age (Table 1 and 1A). Medical records reviews and physical examinations showed that all of the respondents’ children had some identified comorbidity involving insulin resistance, cardiovascular conditions, underlying respiratory conditions, or sleep disturbance (Table 2).

From the 193 surveys, 375 valid cases of qualitative data yielded strong interrater reliability (K = 0.98; p < 0.001). Through the use of categorically ranked healthy lifestyle themes, the parents indicated overwhelmingly that they believed engaging in physical activity (63%) to be the most important factor in managing weight, followed by consuming fruits and vegetables (17%), controlling portions (13%), reduced consumption of sugary drinks (4%), reducing screen time (3%), and eating breakfast and family dinners (both <1%).

On a scale of 1 to 5, with 5 indicating the highest level of importance and concern, parents ranked their child’s changing of eating habits (mean score, 4.7 ± 0.7) and changing of physical activity habits (mean score, 4.7 ± 0.8) as being highly important and causing a high level of concern (Table 3). Parents reported vastly different levels of confidence that they would be able to adopt specific 5-2-1–AN behaviors. Under the “healthy eating” domain, parents indicated high levels of confidence (mean score, 4.7 ± 0.7) in their ability to remove sugary drinks from diets but lower levels of confidence in their ability to promote eating five servings of fruits or vegetables daily (mean score, 3.9 ± 1.2). In the “physical activity” domain, parents reported higher levels of confidence (mean score, 4.0 ± 1.2) in their ability to promote reduction of screen time but lower levels of confidence (mean score, 3.9 ± 1.2) in their ability to promote engagement in vigorous activity.

Overall confidence in ability to change eating habits and change to specific 5-2-1–AN behaviors (eating at least five servings of fruits and vegetables and consuming almost no sugar-sweetened beverages) was assessed. The percentage of respondents who were confident in their ability to promote change in their child’s eating habits was 53.9%. However, only 43.5% felt confident in their ability to get their child to eat more fruits and vegetables daily (5, p < 0.001). However, respondents had greater confidence (60.1%) in their ability to promote reduced consumption of sugar-sweetened beverages (AN) (p < 0.001).

Table 2. Comorbidity distribution

<table>
<thead>
<tr>
<th>Comorbidity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin resistance (acanthosis nigricans and/or hyperinsulinemia)</td>
<td>78.4</td>
</tr>
<tr>
<td>Cardiovascular conditions (elevated blood pressure and/or hyperlipidemia)</td>
<td>58.4</td>
</tr>
<tr>
<td>Underlying respiratory conditions (asthma and/or exercise intolerance)</td>
<td>57.8</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>42.7</td>
</tr>
</tbody>
</table>

Table 1. Baseline characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female [no. (%)]</td>
<td>108 (51)</td>
</tr>
<tr>
<td>Age [mean (SD)] (in years)</td>
<td>11.3 (3.1)</td>
</tr>
<tr>
<td>Initial body mass index percentile [mean (SD)]</td>
<td>99 (1.03)</td>
</tr>
<tr>
<td>Insurance at first visit [no. (%)]</td>
<td>212 (100)</td>
</tr>
<tr>
<td>Race/ethnicity [no. (%)]</td>
<td>212 (100)</td>
</tr>
</tbody>
</table>

Table 1a. Baseline characteristics detail

<table>
<thead>
<tr>
<th>Insurance at first visit</th>
<th>no. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>105 (50)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>101 (47)</td>
</tr>
<tr>
<td>Self-pay</td>
<td>4 (2)</td>
</tr>
<tr>
<td>Tricare (military insurance plan)</td>
<td>2 (1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>no. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian</td>
<td>1 (&gt;1)</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>1 (&gt;1)</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>111 (52)</td>
</tr>
<tr>
<td>Black</td>
<td>36 (17)</td>
</tr>
<tr>
<td>White</td>
<td>75 (35)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>73 (34)</td>
</tr>
<tr>
<td>Black</td>
<td>7 (3)</td>
</tr>
<tr>
<td>White</td>
<td>66 (31)</td>
</tr>
<tr>
<td>Other</td>
<td>26 (13)</td>
</tr>
</tbody>
</table>
activity habits and to change to specific 5-2-1–AN behaviors (reducing screen time to ≤2 hours daily and increasing physical activity to ≥1 hour per day) was also determined. The percentage of respondents who were confident in their ability to promote change in their child’s overall physical activity habits was 57%. However, only 51.3% of respondents reported that they were confident that they could encourage their children to reduce screen time (2, p < 0.001). Finally, only 46.1% of respondents were confident of their ability to promote their child’s adoption of at least one hour of physical activity (1, p < 0.001).

Discussion

Families face numerous and often overwhelming obstacles in managing their obese child’s weight. Though no simple solution exists for weight control, a simplified “road map” for attaining a healthier lifestyle, such as 5-2-1–AN, can focus initial efforts and frame further attempts at adopting behavioral change.

However, among parents of obese children, fewer than half felt confident that they could help their children achieve an increase in fruit and vegetable consumption and to participate in at least one hour of moderate to vigorous exercise each day. This lack of confidence is particularly concerning because respondents indicated that these two behaviors were the most important factors for achieving weight control. This apparent discrepancy highlights the disconnection between well-intentioned desires to be healthy and the adoption of specific, targeted, and actionable behaviors.

Despite the reported low levels of confidence in ability to promote adoption of certain actionable behaviors, the consumption of almost no sugary drinks was the only actionable behavior in the 5-2-1–AN message for which parents felt significantly more confident in their ability to promote. Targeted behavior negotiation for reducing sugary drink consumption is “low-hanging fruit”—it might provide an attainable starting point for goal setting for adopting a healthier lifestyle. This finding supports the need for negotiated lifestyle behavior changes that are targeted, small, measurable, and attainable. Nonspecific confidence in ability to promote adoption of changes in eating behaviors or physical activity level may represent the respondents’ ambition, but actionable change is specific and likely contributed to the decline in confidence. It is by partnering with the family in these negotiated tasks that clinicians can help families increase their sense of self-efficacy and thus their confidence in adopting targeted behaviors such as 5-2-1–AN.

Families often arrive for HCC appointments armed with some awareness about these “5” (eating five servings of fruits or vegetables daily) and “1” (engaging in at least one hour of physical activity daily) behaviors but may lack the readiness or confidence to change their habits.24 This presents an opportunity for the clinician to partner with families in setting realistic and achievable ways to include 5 and 1 behaviors in their lifestyle. Other target behaviors not included in the 5-2-1–AN message (portion control, eating breakfast daily, and encouraging family meals) also appear in varying degrees to be part of the respondents’ awareness regarding weight control and should be considered as other targets in promoting healthy weight management.

As with other nonrandomized cohort studies, the use of a convenience sample of patients and families diminishes the applicability of our findings. The survey tool was adapted from a set script used in evaluation of patients with substance abuse, and therefore, the reliability and validity of these survey items in paper form has not been evaluated. In addition to testing survey validity, future research could examine the cultural competence of the instrument to ensure its applicability in different languages and with different cultural groups. Finally, without longitudinal outcomes ideally linked to discrete patient outcomes, the practical and clinical significance of these 5-2-1–AN outcomes are suggestive but not completely clear.

Table 3. Ranking by survey respondents (n = 193) of importance of changing and confidence in ability to change health-related behaviors

<table>
<thead>
<tr>
<th>Survey topics</th>
<th>Mean score on scale of 1 to 5 (SD)</th>
<th>Percentage of scores of 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating habits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of changing</td>
<td>4.7 (0.7)</td>
<td>78.0</td>
</tr>
<tr>
<td>Confidence in ability to promote change overall</td>
<td>4.1 (1.1)</td>
<td>50.7</td>
</tr>
<tr>
<td>Confidence in ability to remove sugary drinks from diet</td>
<td>4.3 (1.0)</td>
<td>56.6</td>
</tr>
<tr>
<td>Confidence in ability to promote eating five daily servings of fruits or vegetables</td>
<td>3.9 (1.2)</td>
<td>41.0</td>
</tr>
<tr>
<td>Physical activity habits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of changing</td>
<td>4.7 (0.8)</td>
<td>76.6</td>
</tr>
<tr>
<td>Confidence in ability to promote change overall</td>
<td>4.3 (1.0)</td>
<td>53.7</td>
</tr>
<tr>
<td>Confidence in ability to promote reduction of screen time (time spent watching TV, using a computer, and playing video games)</td>
<td>4.0 (1.2)</td>
<td>48.3</td>
</tr>
<tr>
<td>Confidence in ability to promote engagement in vigorous activity</td>
<td>3.9 (1.2)</td>
<td>43.4</td>
</tr>
</tbody>
</table>

SD = standard deviation
This study contributes to the policy and practice efforts in pediatric weight management and in combating childhood obesity by offering relevant information and identifying factors that affect the application of 5-2-1–AN messaging. Given the expanding use of the 5-2-1–0 interventions, evaluation research such as this study explores the effect of a simple evidence-based message regarding a healthy lifestyle. Continued effort and research is needed to assess the effect 5-2-1–AN messaging has on patient-level outcomes.

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

Acknowledgments

We gratefully acknowledge the invaluable assistance of Sharon Corp, RN, in coordination and survey collection; Teresa Nodal, MD, in data abstraction; and Brenda Marm, MSW, and intern Jason Serrano, BSW, in data coding.

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

References


Overeating

Diseases caused by overeating are cured by fasting; those caused by starvation are cured by feeding up.

Diseases caused by exertion are cured by rest; those caused by indolence are cured by exertion.

To put it briefly: the physician should treat disease by the principle of opposition to the cause of the disease according to the form.

— Hippocratic Writings, *Hippocrates, c. 460 BC – c. 370 BC*,

*ancient Greek physician in the Age of Pericles*
Using Implementation and Dissemination Concepts to Spread 21st-Century Well-Child Care at a Health Maintenance Organization

Arne Beck, PhD  
David A Bergman, MD  
Alanna K Rahm, MS  
James W Dearing, PhD  
Russell E Glasgow, PhD

Abstract

We describe here the use of a conceptual framework for implementing and disseminating in a Health Maintenance Organization an evidence-based model of well-child care (WCC) that includes developmental and preventive services recommended by the American Academy of Pediatrics. Twenty-first Century WCC is a parent-centered, team-based, primary care model that combines online previsit assessments—completed by parents and caregivers regarding clinic-based weight, growth, and development assessments—with vaccinations and anticipatory guidance. Nurses, nurse practitioners, developmental specialists, and pediatricians all play roles in the WCC model. Patient and clinician interaction, health records, and resources are all facilitated through a Web-based diagnostic, management, tracking, and resource information tool. Implementation and dissemination concepts and their attendant practices and tools can reliably be used to augment strategic decisions about how to best disseminate and implement innovations in health care delivery. Unlike innovations that are embedded only in technical systems, validated models of team-based health care have multiple components that must be made compatible with complex sociotechnical systems. Interpersonal communication, work, coordination, and judgment are key processes that affect implementation quality. Implementation can involve tailoring to a particular site and customizing either the model or the organizational context to accommodate it.

Introduction

Well-child care (WCC) has been a cornerstone of pediatric practice in the US for many decades, accounting for almost 25% of pediatric visits and more than 50% of all visits in the first year of life. Well-child office visits are designed to identify key health concerns and to provide anticipatory guidance early so that concerns can be effectively addressed before school entry. Unfortunately, WCC interventions of proven benefit that address developmental and behavioral issues often are not provided during well-child visits, developmental assessment is infrequently completed and developmental and behavioral problems that could have been detected and treated with evidence-based practices are too often neither detected nor treated during WCC.

The gap between evidence-based WCC and WCC as delivered persists despite pediatricians’ desires to do a better job at providing these services. Limitations on time, resources, and training contribute to the gap, as do other systems-level barriers.

The increasing application of empiric lessons from implementation and dissemination research to health care delivery holds promise for addressing the failure to bring proven interventions to scale. The purpose of this article is to describe the early-stage application of a model for achieving high-quality implementation of 21st-century WCC at Kaiser Permanente Colorado (KPCO). After this effort and working in collaboration with interested Kaiser Permanente (KP) pediatric leaders programwide, our subsequent goal is dissemination of 21st-century WCC to pediatric practices within other KP regions. We also seek to disseminate this work to other non-KP health care settings such as safety-net clinics.
We present preliminary results from our work, focusing on findings from social network maps that depict who seeks advice from whom about pediatric-care improvements and from focus groups that identify barriers to and facilitators of implementation and help in the design of the 21st-century WCC model.

Setting
KPCO is a nonprofit group-model Health Maintenance Organization (HMO) serving approximately 485,000 members, including 100,000 children in the Denver, Boulder, and Colorado Springs metropolitan areas. KPCO has 18 outpatient facilities, most of which include pediatric and family practices where WCC is delivered. KPCO also has in place an electronic health record containing an electronic personal health record through which members can communicate with their clinicians by e-mail. Current WCC at KPCO includes visits for children at ages 2 weeks; 2, 4, 6, 12, and 15 months; and yearly thereafter for the child's first five years.

Planning for Well-Child Care
An initial year-long planning grant enabled us to plan and conduct pilot tests for a phased implementation of WCC. We met with teams of clinicians and parents to develop and to test responses to three interventions: 1. The tailored WCC encounter using a Web-based previsit assessment to determine child and family needs, the Child Health and Development Interactive System (CHADIS), developed by the Center for Promotion of Child Development through Primary Care. 2. The use of different visit types such as brief physician visits and e-visits to tailor the visit to the biopsychosocial needs of the child and to the parents' and physicians' preferences. 3. An extended visit for children with special health care needs. Plan-do-study-act (PDSA) rapid-improvement cycles (developed by the Institute for Healthcare Improvement) were conducted in two large pediatric practices within KPCO to assess the feasibility of the three visit types. Seven clinicians and 70 parents participated in the cycles. After the WCC visit, clinicians and families were surveyed regarding their experience, and the length of the visit and resources required were documented by clinician self-report. Results indicated that 75% of parents felt that the online previsit assessment improved or very much improved the WCC visit, although 20% of parents found the online assessment somewhat or very difficult to use. All of the parents found the e-visit, or the e-visit with brief clinician visit, to be an acceptable or very acceptable alternative to the standard WCC visit. The majority of clinicians and families participating in the extended visit for children with special health care needs were satisfied with this type of visit. Clinicians felt that the extended visit enabled them to better identify problems, enhanced the efficiency of the visit, and increase care coordination. Families felt that the extended visit afforded them more opportunity to communicate with their pediatrician and helped them to bring together the various aspects of their child's care. All seven clinicians felt that the use of the new model helped to focus the visit and would continue or would definitely continue to use the system. Clinicians reported that the time required to review the previsit summary page ranged from 30 seconds to 2 minutes. More detailed results of the PDSA cycles are described elsewhere.²²

An analysis modeling the cost of these visit types suggested that the WCC model is cost neutral compared with the current system of WCC at KPCO (Debra Ritzwoller, PhD, personal communication, 2009 Mar 15).²²

The gap between evidence-based WCC and WCC as delivered persists despite pediatricians’ desires to do a better job at providing these services. Limitations on time, resources, and training contribute to the gap …
The cost models were based on the assumption that the combination of previsit Web-based assessment and increased use of more time-efficient visits, such as e-visits and brief physician visits for the larger population of low-risk children, would offset the increased costs of targeting more intensive WCC services for the smaller population of children with special health care needs.

A subsequent grant (Commonwealth Fund grant 20080150) is providing support to conduct phased implementation of WCC that is based on our planning results.

**Method**

**Framework for Implementation of Well-Child Care**

After a review of the literature on implementation and dissemination frameworks, we chose PRISM (Practical, Robust Implementation and Sustainability Model) as the primary conceptual framework guiding our implementation efforts. It is represented in Figure 1. The model incorporates concepts from literature about the diffusion of innovations, the Chronic Care Model, model for improvement, and RE-AIM (reach, effectiveness, adoption, implementation, and maintenance). PRISM takes into account the characteristics of the intervention, the external environment, the implementation and sustainability infrastructure, the recipients of the intervention, and how these factors influence the adoption, implementation, and maintenance of the intervention. We focused on specific elements of PRISM especially germane to our implementation. This parsimonious approach enabled us to apply a comprehensive and complex conceptual framework for implementation to a real-world clinical setting.

We also augmented components of the PRISM model related to organizational characteristics and organizational perspective with social network mapping and clinician and staff focus-group methods, respectively. These measurement methods provide critical information on the attitudes of clinicians and staff toward the innovation and their pattern of communication—specifically, advice seeking regarding the innovation that impedes or facilitates its adoption.

**Selection of the Initial Two Implementation Sites**

Selection of the initial implementation sites required a consideration of such organizational characteristics of the recipients as their culture, management support and communication, shared goals and cooperation, leadership, systems and training, data and decision support, staffing and incentives, and expectations of sustainability.

We obtained sponsorship from the regional department chief for pediatrics and pediatric department chiefs at each site, all of whom expressed interest in the project and helped the project team understand site-specific and planwide barriers to WCC implementation. The initial two sites were also chosen because each had clinicians who participated in the planning process and were interested in implementing the model in their clinics. Moreover, the regional department chief for pediatrics recommended these sites. The sites are of different sizes: One is a large practice at a large medical office consisting of ten pediatricians split into two clinician teams; the other is a smaller practice with three pediatricians, located at a smaller medical office. These individuals identified members of the steering committees described in the next section.

**Formation of Site-Specific Steering Committees**

Site-specific steering committees were assembled as a way of planning for implementation and sustainability of WCC. The committees provided a dedicated team, addressed training and support, adapted procedures to their site, and shared best practices regarding WCC. Staff and clinician roles and responsibilities for sustaining WCC were discussed so that once research support for the implementation effort was withdrawn, WCC would continue.

The pediatric chiefs at each site provided the research team with nominees for site-specific steering committees that included broad representation of clinicians and staff (pediatricians, nurses, nurse practitioners, medical assistants or licensed practical nurses). Steering committees also included a parent representative. Committee charters were then developed and approved for each site. Committees continue to meet monthly and are responsible for implementation planning for WCC within their respective practices. Meeting agenda items for the steering committees include the impact of WCC on clinic work flow,
roles of clinic staff in implementing WCC, interfacing Web-based CHADIS assessments with the electronic health record, and integrating pediatric chronic care coordinators or the developmental specialist into WCC visits for children with special health care needs.

Using Data to Drive Implementation: Mapping the Advice Networks in Each Practice

Another component of organizational characteristics of recipients that we thought important to add to the PRISM model was social network analysis to identify advice-seeking patterns regarding innovations in pediatric care. Social network analysis provides statistical and graphic output and has a long history in public health research. Its unique perspective is a focus on the relational characteristics between and among individuals, rather than on the characteristics of the individuals themselves. Sociometric data can identify opinion leaders who can influence the responsiveness and decisions of other caregivers to adopt an innovation like WCC. Intervening with sociometrically identified opinion leaders in health care settings has been shown to dramatically improve and sustain patient outcomes.

Social network statistics provide numeric properties of networks, groups, and individual units. These measures include

- **Betweenness**: The number of links within the network that include a given individual, indicating how much an individual has the potential to control information flows in the network.
- **Power**: A measure of informal power that uses the measures of betweenness and closeness (an indicator of access) to identify individuals who have quick access themselves but stand in the way of access for other individuals within the network. Individuals may use this power for positive or negative purposes.
- **Network reach**: The number of individuals who can be reached in a certain number of steps without being redundant. Individuals with high reach can facilitate dissemination efforts.

We administered a brief sociometric (“who to whom”) questionnaire to all physicians, nurses, and other caregivers in each of the two practices to identify which individuals function as advice-sources (opinion leaders) for innovations in WCC. The questionnaire asked clinicians and staff to identify individuals from whom they sought advice regarding new ideas in pediatric care, and how often they communicated about any topic with that person.

Results

1. Social Network Maps

Data from sociometric questionnaires were analyzed using the social network analysis program InFlow 3.0 (www.orgnet.com). Figures 2, 3, and 3a display the social network maps for each site. Site A is the smaller clinic and site B is the larger clinic. Fourteen clinicians and staff participated from site A and 30 clinicians and staff from site B. We limited the maps so that they show only the most frequent ties (communicate daily or more, communicate weekly), and we examined network-centrality metrics of betweenness, power, and reach to identify opinion leaders at each clinic.

Site A

The network map for site A was revised to account for two opinion leaders who left the clinic after
The use of standardized, Web-based e-visit assessment (CHADIS) was viewed very positively by clinicians and staff because it would give clinicians advance notice of parent concerns and allow them to tailor the visit more appropriately and efficiently.

Because the individuals in this group are in fact part of the network but also operate as a distinct group of professionals outside of the clinic (the pediatric chronic care coordinators), group C was included and analyzed as a distinct group within the larger clinic network.

A total of five opinion leaders were identified from site B. Four opinion leaders were identified from group A on the basis of the metrics of betweenness and power: 021 (developmental specialist), 019 and 008 (both physicians), and 025 (medical assistant). One additional opinion leader was identified from group C, 028, a registered nurse serving as a pediatric chronic care coordinator.

2. Clinician and Staff Focus Groups

Focus groups have a long history in qualitative research and provide valuable information from the participant perspective. We conducted focus groups with pediatricians, registered nurses, and licensed practitioners, or developmental specialist. E-visits were thought to be attractive for parents concerned about convenience, but they were not seen as a substitute for WCC visits; rather, e-visits were considered useful for follow-up about various health conditions (asthma, autism, Attention Deficit Hyperactivity Disorder, enuresis), medication management, and weight management. Extended visits for children with special health needs were uniformly embraced by clinicians and nursing staff. The extra time for the visit, combined with the availability of a pediatric chronic care coordinator, was seen as a more suitable visit for this population with complex multiple health conditions. The extended visit would allow for a coordinated “one-stop shopping” approach...
Using Implementation and Dissemination Concepts to Spread 21st-Century Well-Child Care at a Health Maintenance Organization

whereby all of the health issues and parent concerns could be addressed during one visit instead of being fragmented among several visits.

The use of standardized, Web-based e-visit assessment (CHADIS) was viewed very positively by clinicians and staff because it would give clinicians advance notice of parent concerns and allow them to tailor the visit more appropriately and efficiently. However, logistical concerns were raised, including lack of Internet savvy and/or access among some parents, coordinating with the call center where appointments are made, and increased workload for staff who must contact parents before the visit to acquaint them with CHADIS. Alternatives to using a Web-based version of CHADIS were also discussed, including using handheld data-collection devices or kiosks in the waiting room.

Data from the social network maps and focus groups will help us better understand attributes of WCC from which we will tailor the model and create effective workflows, as well as tailor targeted clinician and family messages (social marketing) to promote adoption of WCC. In this way, the implementation process is planned as an effort driven primarily by the clinicians and staff at the two sites rather than an intervention imposed on them by the project team. Of course, logistic adaptations to the implementation site must be balanced with efforts to retain core WCC components to preserve fidelity to this model. The constant tension between external and internal validity is common and one that must be thoughtfully addressed to ensure successful implementation efforts.

Using the RE-AIM Model

Once implementation is under way, we will use measures of spread to assess the impact of our implementation efforts at the two sites. Specifically, the RE-AIM framework will be used to plan for and measure spread of new programs. RE-AIM uses validated measures of reach, effectiveness, adoption, implementation, and maintenance to assess the spread of the intervention across different systems of care. For this implementation effort, we operationalize each of the RE-AIM components as follows:

- **Reach**: Percentage and representativeness to KPCO membership of parents invited who participate in WCC.
- **Effectiveness**: Percentage of WCC visits in which standardized developmental and behavioral screening are conducted, referral and referral completion, and any unanticipated consequences of increased screening and assessment (eg, use of more services or offsets of other services).
- ** Adoption**: Proportion and representativeness of practitioners and practices that participate in WCC.
- **Implementation**: Consistency of delivery of WCC procedures across staff and over time, and the time and costs associated with these activities.
- **Maintenance**: Percentage of practitioners and practices that replicate and continue the WCC program and whether and how they change or adapt the program.

Because measures of impact from the RE-AIM model are primarily summative and have data that have not yet been collected, we will present the data in a future article.

**Discussion**

Our work was guided by selected components of the PRISM framework for implementation that focuses on organizational characteristics of the recipients, organizational perspective, implementation and sustainability infrastructure, and how these factors are known to influence the adoption, implementation, and maintenance of the intervention.

We specifically reported findings from social network maps and clinician and staff focus groups. Social network analysis of advice seeking identified key personnel at each implementation site on the basis of the network centrality metrics of betweenness, power, and network reach. We will recruit these opinion leaders to talk positively about WCC and provide them with communication materials and resources to reinforce the positive characteristics of WCC, address barriers to implementation, and encourage decisions to adopt it in their clinics.

During our experience with site A, we also learned that the results of social network analysis can be outdated quickly when employee turnover occurs. However, it was of interest to observe how the social network changed as a result of this turnover and subsequent introduction of a new formal leader into the site.

Focus groups and discussions with key opinion leaders helped identify barriers and facilitators to implementation. These more operational data address what PRISM labels as the implementation and sustainability infrastructure and the recipients of the intervention. Focus-group results pointed to the need for WCC that is member-centric, is logistically feasible (eg, having multiple modes of completing previsit assessment; being compatible with current appointment-scheduling procedures, including the challenge of advanced access for WCC appointments that compress the previsit assessment period), is flexible (offering choice of clinician and visit type), offers...
visits tailored to the needs of children and their parents (eg, longer visits for children with special health care needs), and accounts for clinicians’ time constraints both at the visit and in pre- and postvisit documentation.

Once we have completed implementation at the two initial sites, we will spread the model to three additional pediatric practices by applying some of the same implementation and dissemination concepts, including social network maps, focus groups, discussion with key opinion leaders, and communication of social-marketing messages. In addition, we will invite clinicians and staff from practices that have not yet implemented WCC to observe how the model works at the initial implementation sites.

Ultimately we plan to implement WCC across all pediatric practices at KPCC and then collaborate with interested KP leaders programwide to make the model available to other KP regions for implementation while adapting it to their local practices. We also plan to promote its adoption in similar integrated health care systems. In addition, we are currently collaborating with a large local community health system with safety-net clinics that serve a population primarily of Medicaid recipients and Latinos. We are adapting WCC to this population on the basis of user and stakeholder feedback (eg, bilingual materials, potential alternate forms of previst assessment than the Internet, and use of a promotoras [health educators] to guide parents and children through the WCC visits) so that if the adapted program is successful, it may also be spread to other community health centers and safety-net clinics.

Conclusion

We have described here the application of implementation and dissemination conceptual framework from the literature to facilitate the spread of WCC. Although our results are preliminary, we believe the use of these frameworks has thus far significantly aided our efforts in the implementation of WCC at KPCC.

We believe that the use of an implementation and dissemination conceptual framework augmented with focus group and social network mapping methods provides valuable data that have helped us develop a detailed and tailored implementation plan for 21st-century WCC, facilitating the implementation process and improving our chances of success in spreading and sustaining WCC in our pediatric practices. We reiterate that because models for implementation and dissemination are context sensitive and complex, selecting, modifying, and adding elements from these frameworks for our specific application to WCC proved a fruitful approach.

* Health Economist, Institute for Health Research, Kaiser Permanente CO.

Disclosure Statement

This research is funded in part by The Commonwealth Fund, grant #20080150.

Acknowledgments

We would like to acknowledge the exceptional support and collaboration from the Pediatrics Departments at the Westminster, Southwest, and Arapahoe Medical Offices, in CO and especially Bruce Doenecke, MD; Shilpa Fellers; and Adrienne Silver, MD. We would also like to thank Susan Pharo, MD, Regional Department Chief for Pediatrics, for her strong support of the WCC project. Finally, we thank Ms Dilsha Happel for her valuable participation as a parent member of the advisory committee; Jennifer Dickman and Rasheed Lawal for their insightful assistance with data collection and analysis; and Sharma Cummings for her excellent administrative support.

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

References

Using Implementation and Dissemination Concepts to Spread 21st-Century Well-Child Care at a Health Maintenance Organization

To Assume Responsibility

That proper shelter, nutrition, clothes, education, and health measures be provided each child to assure that each, with maturity, can assume the full responsibilities of adulthood and citizenship.

— The Children’s Bill of Rights, Billy F Andrews, MD, Pediatrician
soul of the healer

Fred M Freedman, MD, is a retired Neurologist from the South Bay Medical Center. He enjoys painting in oil on canvas. The inspiration for many of his paintings are scenes from his travels. Dr Freedman has done artwork all his life, including painting in oil and gouache and etchings. This painting was inspired by a trip to Zion National Park shortly after his retirement.

“Zion 3 – Along the River Walk”
24x30
Oil on canvas

By Fred M Freedman, MD
A Quality-Improvement Project

Use of a Computerized Medical Database and Reminder Letters to Increase Preventive Care Use in Kaiser Permanente Patients

Abstract
Context: Previous studies have suggested that preventive health care measures may be improved by proactive patient-reminder systems and use of electronic medical databases.

Objective: Our objective was to use Kaiser Permanente’s (KP’s) electronic medical databases to improve the preventive health care delivered to KP patients in Honolulu, HI.

Design: Patients not seen by their primary care physician in more than one year (“low-utilizing patients”) and overdue for preventive health care services were identified using KP’s electronic medical databases. These patients were then sent letters requesting that they obtain these services. Response rates and results of their screening tests were tracked.

Results: Of 309 letters sent, 84 (27.2%) patients responded. Of the 260 patients who were reminded of overdue immunizations (tetanus, pneumonia, influenza, or a combination of these), 51 (19.6%) came in to obtain them. Ten of the 37 (27.0%) women overdue for breast cancer screening came in for mammograms. Eleven of the 109 (10.1%) patients overdue for colorectal cancer screening completed fecal occult blood testing.

Conclusion: Outreach letters that target low-utilizing patients identified by an electronic medical database may be an efficient and cost-effective way of improving patient use rates of preventive health care.

Context
Preventive medicine is the forefront of medical care. It is cost-effective, improves morbidity, and reduces mortality. However, it is also often overlooked. A report of a study of 12 metropolitan areas published in 2003 noted that on average, US patients receive only 55% of recommended preventive care. Since then, various strategies have been pursued to improve outreach to patients to address preventive-care deficiencies.

One example is the use of patient-reminder systems, such as phone calls or letters. These have been successfully used to improve preventive care such as vaccinations, cancer screening, smoking cessation, and diabetes management. However, although mass mailings or phone calls can target large volumes of patients, they are impersonal and cannot be tailored to address multiple deficits in preventive care without individual analysis of each patient’s record, which would be time-consuming and impractical for a busy practice or large health maintenance organization to manage. Thus, generic patient-reminder systems can address preventive care only on a population level, not at the individual level.

Electronic medical records (EMR) have also been successfully implemented as another tool to improve preventive medicine. By consolidating patient records into a single database, clinicians can easily access and reference infor-
Use of a Computerized Medical Database and Reminder Letters to Increase Preventive Care Use in Kaiser Permanente Patients

... the PMST allows physicians to address the health of their patients at both a population level and an individual level.²⁸

In an effort to address preventive medicine at a population level while addressing each patient as an individual, a group of Kaiser Permanente (KP) physicians designed the Panel Management Support Tool (PMST). The PMST is a Web-based computerized member database designed to complement the existing KP EMR database (KP HealthConnect). By offering summary information for each primary care physician’s (PCP’s) panel of patients, it allows for specific targeting of defined subsets of patients in each panel. It can also identify specific deficits in preventive care for each individual patient. Used in a proactive manner, the PMST allows physicians to address the health of their patients at both a population level and an individual level.²⁸

Objective

We sought to use the PMST to improve the level of preventive health care delivered to KP patients in Honolulu, HI.

Methods

Design Overview

Four internal medicine residents, under the supervision of a staff physician at the KP Honolulu clinic, piloted a quality-improvement project designed to use the PMST. Each resident analyzed their preceptor’s panel with the PMST. Patients who had not been seen by their PCP in more than one year (“low-utilizing patients”) were first identified. The patients were then screened by the PMST for overdue care on the basis of national recommendations for preventive health care services (eg, vaccinations, screening laboratory tests, cancer screening). Targeted patients were sent a personalized reminder letter requesting that they come in to receive overdue health care services. Patient responses were subsequently tracked to determine the efficacy of this strategy.

Setting and Participants

The project was conducted from September 2006 through March 2007. Panels for four KP internal medicine physicians, all based at the Honolulu clinic (an urban clinic), were used. Panel sizes ranged from 783 to 1799 patients, with a total of 5196 patients initially screened. (Range in panel sizes was due to clinic adjustments for practitioner employment level, from full time to half time.) Using the PMST, patient panels were divided by month of birth (September through December birthday months were randomly targeted), for ease of approach for initial screening, for a total of 1440 patients. Patients seen by a PCP within one year were then excluded. The PMST then identified 309 remaining patients who did not meet screening recommendations for hyperlipidemia, diabetes, kidney function, mammography, or fecal occult blood testing according to national guidelines, as well as recommended immunizations for tetanus, pneumonia, and/or influenza vaccination. These showed up as a “care gap” in the PMST.

No review by an institutional review board was done, because this study was an internal quality-improvement project.

Design

As mentioned, we first used the PMST to identify low-utilizing patients. Preventive services targeted included screening for cholesterol level and glucose level; kidney function testing; cancer screening, tetanus, pneumonia, and/or influenza vaccines; and mammograms and/or fecal occult blood testing.

We then did a brief chart review to exclude patients who had an upcoming medical appointment or who had been recently contacted to come in for health care. Letters were sent to the identified patients, notifying them of overdue services and requesting that they come in to obtain these services within the next month. Chart review and letter preparation took approximately four to five minutes per patient. A response period of three months was allowed, randomly chosen to show a temporal relationship between the outreach letters being sent out and the patients coming in for care.

Laboratory test results were communicated by letter or phone call, by the residents, under the supervi-
sion of a KP staff physician, to the patients who came in response to the outreach letters. Abnormal laboratory test values were defined as any test value outside of the normal value range. Educational booklets (about high cholesterol, prediabetes, etc) were sent to patients with abnormal test values. Medications were initiated and follow-up testing and referrals were recommended if deemed appropriate.

Patient responses were tracked as results were received. Patient encounters were documented in the KP medical database so that the primary care teams would be aware of the outreach efforts and could follow up regarding any test results.

Results

Patients’ responses to the letters were tracked and examined in relation to age and sex (Table 1), type of care requested, and clinician panel size. Of those targeted patients, 160 of 309 (52%) were older than 50 years and 149 (48%) were younger, with the mean age being 49.2 years. The median age was 50 years (range, 22–90 years). Of the 309, 175 (57%) were women and 134 (43%) were men.

Of the identified patients, 128 were overdue for screening blood work, 260 for vaccines, and 122 for cancer screening (mammogram and/or fecal occult blood testing). Most patients were overdue for a combination of these. Of the 309 patients to whom letters were sent, 84 (27.2%) responded (Table 2): 42 came in for blood work, 51 came in to receive recommended vaccinations, and 21 completed requested breast cancer screening or initial colon cancer screening (not equal to 84 because some patients received more than one type of care). Of the 260 patients who were reminded of overdue immunizations (tetanus, pneumococcal, influenza, or a combination of these), 51 (19.6%) came in to have them completed. Ten of the 37 women (27.0%) overdue for breast cancer screening came in for mammograms, and 11 of the 109 patients (10.1%) overdue for colorectal cancer screening completed fecal occult blood testing.

Four different PCP panels, ranging from 783 to 1799 patients, were screened by the PMST. Response rates from each clinician ranged from 20.7% to 38.2% (Table 3).

Discussion

This quality-improvement project used the PMST to specifically target low-utilizing patients. By doing this, we focused preventive care on patients who might never have otherwise sought it. Using a reminder letter, we obtained an overall response rate of 27.2%, which is comparable to that of other studies using such letters (range, 19%–69%).2–4,7,9,11,12,15,29,30

Aside from providing the benefits of routine screening, outreach letters might also improve future medical care for low-utilizing patients. A meta-analysis by Cabana and Jee31 of five studies examin-
Use of a Computerized Medical Database and Reminder Letters to Increase Preventive Care Use in Kaiser Permanente Patients

The potential ease of use by medical support staff would also make preventive care efforts cost-effective and less dependant on the individual PCP.

The Permanente Journal/ Summer 2009/ Volume 13 No. 3

The PMST also identified patients who were arbitrarily assigned to a PCP’s panel but had never seen their PCP before. A study by Zhu et al.32 showed that patients sent reminder letters for health screenings who saw physicians new to them had odds ratios six- to eightfold higher for obtaining health screenings than patients who did not see a physician. Therefore, targeting this population of patients could result in improved screening for preventive care.

The PMST screened multiple areas of preventive care, including screening laboratory tests, immunizations, and cancer screening. This allowed multiple deficiencies to be addressed in a single letter. A study by Burack et al.33 showed that the combination of reminders for Papanicolaou smears and mammograms had an independently better effect on cervical cancer screening than did a reminder for a Papanicolaou smear or a reminder for a mammogram alone.34 Another study by Terrel-Perica et al.35 showed that patients who received a combination letter for both influenza and pneumococcal immunizations were more likely to receive simultaneous immunization than were patients who received a letter for only influenza vaccination or no letter at all.

Thus, targeting multiple deficiencies in different areas of preventive care demonstrated improved outcomes for screening with sustained continuity of care. Thus, inducing low-utilizing patients to see their PCP again could potentially increase future compliance with preventive-care plans.

The PMST was used to screen the differently sized panels of four clinicians of various experience levels, with response rates of 20% to 38%. Although various studies have shown that clinician characteristics can be a barrier to certain types of preventive care,34–36 these response rates demonstrate that different providers can use the PMST effectively for preventive care.

Finally, although resident physicians performed this project, the PMST is relatively simple to use. By delegating screening to medical support staff members, PCPs can address more preventive care needs. In a study by Denberg et al.,37 93% of patients reported that they believed that PCP involvement in preventive health care is not always necessary, is inconvenient, or represents an unnecessary expense, and more than 70% said that they were open to a non-PCP-centered method of receiving preventive services. Our design was simple and easily reproducible and could easily be implemented by medical support staff.

Our results show that an EMR database program such as the PMST is a useful tool for increasing patient use of preventive health care. By specifically designing outreach letters for individual deficiencies in preventive care, clinicians can attempt to ensure adequate preventive-care measures for all of their patients, rather than only the patients who frequently come in to receive health care. The potential ease of use by medical support staff would also make preventive-care efforts cost effective and less dependant on the individual PCP.

Thus, the PMST would allow PCPs to reach out to large populations of patients deficient in multiple aspects of preventive care with minimal cost and effort.

Future Directions

The protocol we used was simple enough to be carried out by medical support staff and would be easy to transition to a larger scale. This project could be expanded to include the entire Honolulu clinic or even the entire region. A larger, prospective, randomized study might be considered to further evaluate efficacy and outcomes.

In addition, a more detailed assessment of laboratory value or screening abnormalities might give further information about the effect of this type of proactive preventive care on patients. For example, a diagnosis of overt diabetes, instead of prediabetes, would likely have a much more significant effect on the projected morbidity and mortality of a low-utilizing patient. Similarly, benefits of renal function monitoring might have more of an effect in patients with a lower glomerular filtration rate than in those with healthier kidneys.

To further evaluate the effect of the outreach letters, simple follow-up surveys could be sent to the targeted patients to assess whether the letters influenced their health awareness, views of KP, or perception of their overall health.

Conclusion

Using an electronic medical database that can target low-utilizing patients and reminder letters may improve preventive health care offered to KP patients. 

Disclosure Statement

The author(s) have no conflicts of interest to disclose.
Acknowledgment

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

References


Modern Life

The overwhelming importance of preventive medicine, sanitation, and public health indicates that in modern life the medical profession is an organ differentiated by society for its own highest purposes, not a business to be exploited by individuals according to their own fancy.

— Medical education in the United States and Canada, Abraham Flexner, 1866-1959, American Educator
Reducing Newborn Office Visits and Improving Satisfaction through Parent Education and Learning Communities

Introduction

First-time parents have many questions about caring for their newborns, including concerns that are not addressed during the standard follow-up visits two days and two weeks after childbirth. These questions often bring the parents into the physician's office, but in many instances these visits are unnecessary and the issue could have been resolved by phone or by e-mail. In my clinical experience, parents are often annoyed when they realize that this is the case; they feel that they have wasted their time and money. At the same time, unnecessary visits increase costs and overburden physicians with visits that do not require their specialized training, leading to job dissatisfaction and burnout. Thus, the Kaiser Permanente (KP) health care system is adversely affected by these unnecessary visits.

Educational programs can empower patients by teaching them when it is necessary to come in for a visit and when they can wait a situation out or try home remedies. Group education is an efficient way to educate patients and parents. It offers an opportunity for clinicians to reach more than one person at a time while providing parents the chance to learn and feel support from others in a situation similar to their own.

Numerous types of pediatric office visits can be handled by inexpensive patient-education programs or parents sharing knowledge with each other. These include routine questions from new parents, particularly at key child-development milestones, and questions about newborn rashes, breastfeeding, constipation, and upper respiratory infections.

At KP San Jose (formerly Santa Teresa), we conducted a pilot program targeted at parents of newborns to test the hypothesis that education, specifically group education with phone follow-up, could serve to reduce the frequency of unnecessary office visits while simultaneously increasing member satisfaction with KP's newborn care experience.

Methods

Newborn Classes and Participants

Fourteen classes were offered from September 5 to October 25, 2007, each at 11 AM. Classes were held at that time so that parents could meet the goal of an 11 AM discharge from the hospital after giving birth, then immediately attend the class.

Participants were recruited in their hospital rooms on the day of discharge from the hospital. In addition, signs announcing the class were posted in the labor and delivery room and the Mother-Baby Unit during the two weeks before the start of the pilot. The nurses, charge nurses, and I went to each mother's hospital room 30 minutes before each class to encourage parents to attend. Study control subjects were recruited by randomly selecting medical record numbers of babies born on those days during the pilot study period when the class was not offered. Because this was done as a quality-improvement project and not as a research study, no institutional review board approval was necessary.

Interventions

Parents in the control group received the standard discharge teaching and handouts from nurses while in the hospital. The mothers and newborns returned for a visit one to two days after discharge from the hospital. After this visit, the next routine well-child visit was scheduled at two to four weeks after childbirth (Figure 1).

In the intervention group, parents received discharge teaching from nurses but while still in the hospital also participated in a group class and received a 17-page handout with color photographs entitled The First Two Weeks with Your New Baby: What You Really Need to Know. Newborns were seen for the follow-up visit at days one and two as usual, but in addition, their parents were given the opportunity to participate in conference calls with other parents beginning one week...
after leaving the hospital. Each parent could participate in more than one call. The calls were moderated by a pediatrician (the author), and during the calls, the parents could ask questions, voice concerns, and learn from other parents going through the same experiences. Finally, they had their next usual well-child check at two to four weeks after birth (Figure 1).

I surveyed both groups by phone two weeks after discharge to assess their satisfaction with their experience in the hospital and to evaluate how likely they would be to recommend KP as a place to have a baby. I also performed a chart review for babies of those responding to the survey to see if there was a difference between the two groups in the number of unnecessary visits in the first two weeks and four weeks after hospital discharge. Unnecessary visits were defined as any visit that resulted in no prescription or where the baby was healthy and the situation could have been handled with education or over the phone. Visits were excluded if they were initiated by a physician, resulted in a prescription or admission to the hospital, or were coded as jaundice or a weight check. Outcome variables were satisfaction with the experience and service in the hospital and the number of unnecessary visits in the first four weeks after discharge from the hospital.

Conference Calls
There were seven follow-up conference calls scheduled, one call per week from September 13 to November 1, 2007, each at 6:30 pm. Parents were given the call-in number during the hospital class. To protect confidentiality, they were given a unique identifier number to use when they called. All parents were e-mailed and/or called the night preceding the call as a reminder of the service.

Follow-Up Questionnaire
Members of the control and intervention groups were contacted two weeks after their discharge from the hospital to participate in a six-question phone survey to assess satisfaction with their experience in the hospital. They were asked to answer the questions on a 5-point scale, with 1 being the lowest level of satisfaction and 5 being the highest.

Questions 1 and 2 assessed the participants’ satisfaction with the educational materials that they received in the hospital about how to care for a baby in general and about breastfeeding and breastfeeding support specifically. Question 3 asked how prepared parents felt to care for the new baby after having read the educational materials received in the hospital.

Questions 4 through 6 were the Member Patient Satisfaction (MPS) questions and asked how satisfied the participants were with their care in the hospital and since they had left the hospital and how likely they were to recommend KP as a place to have and to care for a new baby. Participants in the intervention group were also asked to rate the usefulness of the class and handbook and the conference calls (if they participated). All participants were given the chance to make comments about their experiences and ideas for potential improvements.

Cost-Savings Analysis
Office visits were estimated to cost $114 each. This number included the cost of a call to the call center as well as the overhead costs of a visit including supplies and staffing (Michelle Su, personal e-mail communication, 2008 Jan 8). Cost savings were calculated as follows:

\[
\text{Cost savings} = \frac{\text{Total savings} - \text{cost of pilot}}{\text{Total savings}} \times 100
\]

The return on investment was calculated as follows:

\[
\text{Return on investment} = \frac{\text{Total savings} - \text{cost of pilot}}{\text{cost of pilot}} \times 100
\]

Table 1. Number of children for each mother who completed the questionnaire

<table>
<thead>
<tr>
<th>Group</th>
<th>First child</th>
<th>Second child</th>
<th>First or second child</th>
<th>Third or later child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>43 (72%)</td>
<td>13 (22%)</td>
<td>56 (93%)</td>
<td>4 (7%)</td>
</tr>
<tr>
<td>Control</td>
<td>21 (33%)</td>
<td>25 (43%)</td>
<td>46 (77%)</td>
<td>14 (23%)</td>
</tr>
</tbody>
</table>

* A first-time mother of twins in the intervention group is included in the “First child” column and “First or second child” column.
Statistical Methods

Statistical analysis was performed using SAS (version 9.1; Cary, NC, US). Median scores from each survey item (or from the mean of several items) were compared between the intervention group and study control subjects using the Wilcoxon two-sample test. Statistical significance was set at p < 0.01. A first-time mother of twins was classified as having one child for analysis of maternal experience. Survey results were counted once for the mother of twins, whereas both twins contributed to the analysis of the number of unnecessary visits.

Results

Participation

Parents of a total of 62 newborns (including one set of twins) participated in the 14 classes offered from September 5 to October 25, 2007. Of the 61 classroom participants, parents of 11 newborns (18%) participated in the conference calls, and the participation in the calls ranged from one to four mothers or sets of parents. Forty percent of those who used the service (five mothers or sets of parents) participated in two or more of the calls. In the second week of the study, we added e-mail reminders the night before each call, which seemed to boost attendance: The first week, no parent participated in the phone calls, whereas after the e-mail reminders, a minimum of two mothers or sets of parents participated in each conference call except during the last week, when only one parent called.

We were able to reach 60 of the original 61 mothers or sets of parents in the intervention group for completion of the follow-up survey at two weeks. We spoke with parents of 60 newborns in the control group. There were more first-time mothers in the intervention group (43 vs 20 in the control group) and more mothers with three or more children in the control group (4 vs 14 in the intervention group; Table 1). The two sets of parents that we were unable to reach did not differ in age or parity from the remainder of the intervention group.

The most common subjects of questions in order of frequency were breastfeeding, umbilical cord care, sleeping schedules and sleep practices, colic and gassiness, and rashes and other newborn skin conditions.

Satisfaction with Service

For each survey respondent, the mean of their six survey question responses was computed as well as the mean for the three MPS questions (questions 4–6). The median of the mean survey scores (all questions) in the intervention group was 15% higher than in the study control subjects (median, 4.8 in the intervention group, vs 4.2 in the control group; p < 0.001; Table 2). Five of the six individual questions also showed significant differences between the groups; the median score for question 3 was numerically higher in the intervention group but did not reach statistical significance (p = 0.022). The median of the mean MPS scores was also significantly higher in the intervention group (p < 0.0001).

<table>
<thead>
<tr>
<th>Question</th>
<th>Control: 25th, 50th, 75th percentile</th>
<th>Intervention: 25th, 50th, 75th percentile</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How happy were you with the information you received when you left the hospital about how to care for your baby in the first two weeks?</td>
<td>3.5, 4.0, 5.0</td>
<td>4.0, 5.0, 5.0</td>
<td>0.0012</td>
</tr>
<tr>
<td>2. How happy were you with the information you received about how to get support for breastfeeding if you had questions?</td>
<td>3.0, 5.0, 5.0</td>
<td>5.0, 5.0, 5.0</td>
<td>0.0010</td>
</tr>
<tr>
<td>3. How prepared were you for issues that came up in the first two weeks with your baby?</td>
<td>3.0, 4.0, 5.0</td>
<td>4.0, 5.0, 5.0</td>
<td>0.0222</td>
</tr>
<tr>
<td>4. How supported did you feel by KP in helping with the first two weeks with your baby?</td>
<td>4.0, 4.0, 5.0</td>
<td>5.0, 5.0, 5.0</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>5. How happy are you with the care you received at KP during the first two weeks of your baby’s life?</td>
<td>4.0, 4.0, 5.0</td>
<td>5.0, 5.0, 5.0</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>6. How likely are you to recommend KP as a place to have and care for your baby?</td>
<td>4.0, 4.0, 5.0</td>
<td>4.0, 5.0, 5.0</td>
<td>0.0004</td>
</tr>
<tr>
<td>Mean of 4–6</td>
<td>3.7, 4.0, 5.0</td>
<td>4.5, 5.0, 5.0</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Mean of 1–6</td>
<td>3.6, 4.2, 4.7</td>
<td>4.5, 4.8, 5.0</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

* Questions were answered on a 5-point scale, with 1 being the lowest score and 5 being the highest.

KP = Kaiser Permanente
Because participation was voluntary, there was naturally a self-selection for first-time parents in the intervention group, which could potentially skew the data. However, satisfaction was significantly higher in the intervention group than among study control subjects for women who had two children, as well as for first-time parents (Table 3).

Although the feeling of preparedness was higher in the intervention group as a whole (median, 5.0) than in the study control subjects as a whole (median, 4.0), the feeling of preparedness in first-time parents was not significantly different between intervention and study control subjects (median, 4.0 in controls and in intervention group; p = 0.14).

In intervention parents, the score for the usefulness of the class ranged from 3 to 5, with a median score of 5. The usefulness of the conference calls was scored a perfect 5. A sampling of comments can be found in Table 4.

Reduction in Visits

We then looked at whether additional information and support significantly reduced the number of unnecessary visits in the first two weeks, second two weeks, and overall four weeks after discharge. We excluded from analysis data for three control-group women whose babies did not appear to have received any care from KP after discharge. Top reasons for visits in both the intervention and control groups included questions about gas, umbilical cord issues, eye discharge, rashes, and feeding. Of note, these were also among the most common topics handled on the conference calls.

Overall, there were 52% fewer unnecessary visits by parents in the intervention group (14 visits) than by those in the control group (29 visits) during the first four weeks after discharge (Table 5). Among parents who participated in at least one follow-up conference call, there was an even greater reduction in office visits. Those parents who participated in multiple conference calls had no unnecessary visits in the first four weeks after discharge.

Call Center Use

We also looked at the number of calls to the advice center in both groups in the four weeks after discharge from the hospital. The ratio of calls (46) to babies (61) in the intervention group (75%) was slightly lower than in the control group (44 calls for 57 babies, or 77%). The difference did not reach statistical significance. However, we included only the calls that led to an appointment and did not investigate the advice-only calls. There might have been a larger effect on call volume reduction if these calls had been included.

Cost-Savings Analysis

The intervention group made 15 fewer office visits than the control group did. At the estimated cost of $114 per visit, this represents a total savings of $1710. The cost of the pilot program was $1815. This cost includes the price of making the booklets and other handouts, the fliers advertising the class, and paying for the author’s time to teach the classes during regular clinic office hours and to conduct the conference calls in the evenings. We therefore did not achieve an overall cost reduction in this pilot.
Discussion

Study data were limited and the conclusions here are only preliminary. However, this pilot study suggests that when parents are provided with a class, a reference booklet, and the opportunity to ask questions at regularly scheduled calls, they will avoid making unnecessary office visits. This reduced use of office visits has the potential to provide substantial cost savings.

I offer the following recommendations on the basis of my experiences during the pilot study for future attempts at replicating this program. These recommendations are based on an extrapolation of the findings, but I hope that they will provide leadership for next steps and challenge others to both implement and improve on the findings.

First, the classes should be offered daily and be taught by licensed vocational nurses but supervised by physicians. There should be ample advertising and information about the classes on the Mother Baby Unit so that the parents know that the classes exist and could ready themselves in advance to attend one before going home. Second, the follow-up phone calls should be offered at a variety of times and days throughout the week, thus providing more opportunities to use the service. More clinicians should participate in the calls, allowing more times to be offered without significantly affecting any one clinician’s schedule; this would also increase the possibility that parents would have the opportunity to go through the experience with their own physician, thereby creating a stronger bond. Finally, prescheduling and automated reminders should be used to increase participation. Therefore, the parents would receive an automated phone call and an e-mail reminder before each call.

This very simple approach of group classes and conference calls substantially affected patients’ enjoyment of the KP birthing experience and served to decrease the number of unnecessary and potentially frustrating visits. We have provided the framework for a fast, low-cost way to harness technology and the power of groups to increase patient satisfaction and lower cost by reducing unnecessary visits. *Data Consultant, The Permanente Medical Group*

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

Acknowledgments

The author would like to thank Ashley Coates and Maryanne Armstrong, The Permanente Medical Group Department of Research (Oakland, CA), for performing the statistical analysis; and Naomi Ruff of RuffDraft Communications for an initial edit of this manuscript.

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

References


Table 5. Number of children with any unnecessary visits, number of unnecessary visits per child, and total number of unnecessary visits

<table>
<thead>
<tr>
<th>Group</th>
<th>Weeks 1–2: no. of children (no. of visits, range)</th>
<th>Weeks 3–4: no. of children (no. of visits, range)</th>
<th>Weeks 1–4: no. of children (no. of visits, range)</th>
<th>Total no. of unnecessary visits in weeks 1–4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group (60)</td>
<td>11 (1, 4)</td>
<td>9 (1, 3)</td>
<td>18 (1, 7)</td>
<td>29</td>
</tr>
<tr>
<td>Intervention group total (61)</td>
<td>8 (1, 1)</td>
<td>6 (1, 1)</td>
<td>12 (1, 2)</td>
<td>14</td>
</tr>
<tr>
<td>Class only (50)</td>
<td>7 (1, 1)</td>
<td>5 (1, 1)</td>
<td>10 (1, 2)</td>
<td>12</td>
</tr>
<tr>
<td>Class and 1 call (7)</td>
<td>1 (1, 1)</td>
<td>1 (1, 1)</td>
<td>2 (1, 1)</td>
<td>2</td>
</tr>
<tr>
<td>Class and ≥2 calls (4)</td>
<td>0 (0, 0)</td>
<td>0 (0, 0)</td>
<td>0 (0, 0)</td>
<td>0</td>
</tr>
</tbody>
</table>
soul of the healer

“Grand Teton Range”
Photograph

By Gary Larsen

Gary Larsen is a Clinical Microbiologist in the bacteriology section of the Northern California Regional Laboratory in Berkeley, CA. He loves the outdoors and enjoys landscape photography. He has been shooting photos since the age of ten when he got his first camera, the Kodak Brownie Starflex. Today he shoots all digital with Nikon cameras and uses image-enhancing software. His most enjoyable moments are when he combines hiking with photography to capture spectacular outdoor scenes. This photograph was taken while hiking in Grand Teton National Park, Wyoming.
Nursing Responses to Transcultural Encounters: What Nurses Draw on When Faced with a Patient from Another Culture

Abstract

Objective: We explored nurses’ experiences when they encounter patients from cultures other than their own and their perception of what helps them deliver culturally competent care.

Methods: Registered nurses from all shifts and units at Kaiser Permanente Santa Clara Medical Center were invited to complete a questionnaire. Within the time frame allowed, 111 nurses participated by returning completed questionnaires. A descriptive survey was conducted using a questionnaire that contained multiple-choice, fill-in-the-blank, and open-ended items.

Results: A large majority of respondents reported that they drew on prior experience, including experience with friends and family, and through their education and training, and more than half also included travel experience and information obtained through the Internet and news media. They also expressed a desire for more training and continuing education, exposure to more diverse cultures, and availability of more interpreters. When respondents were asked to enumerate the cultures from which their patients have come, their answers were very specific, revealing that these nurses understood culture as going beyond ethnicity to include religious groups, sexual orientation, and social class (eg, homeless).

Discussion: Our research confirmed our hypothesis that nurses are drawing heavily on prior experience, including family experiences and experiences with friends and coworkers from different cultures. Our findings also suggest that schools of nursing are providing valuable preparation for working with diverse populations. Our research was limited to one geographic area and by our purposeful exclusion of a demographic questionnaire. We recommend that this study be extended into other geographic areas. Our study also shows that nurses are drawing on their experiences in caring for patients from other cultures; therefore, we recommend that health care institutions consider exposing not only nurses but also other health care professionals to different cultures by creating activities that involve community projects in diverse communities, offering classes or seminars on different cultures and having an active cultural education program that would reach out to nurses. The experiences provided by such activities and programs would help nurses become more sensitive to the differences between cultures and not immediately judge patients or make assumptions about them.

Celeste Cang-Wong, RN, MS Candidate, is the Perioperative Nurse Manager for the Kaiser Permanente Santa Clara Medical Center, San Jose, CA. E-mail: celeste.cang@kp.org.

Susan O Murphy, RN, DNS, is a Professor Emeritus in the School of Nursing, San Jose State University, San Jose, CA. E-mail: somurphy@earthlink.net.

Toby Adelman, RN, PhD, is an Associate Professor in the School of Nursing, San Jose State University, San Jose, CA. E-mail: tadelman@son.sjsu.edu.
diversity through creating professional development opportunities. Overall, the commission emphasized the importance of increasing the representation of minorities in the workforce.

Despite this growing diversity in the US and in our service area, diversity among nurses has not kept up with that of the population. In many health care settings, nursing does not reflect the demographics of the general population. Even when nurses are well educated and culturally sensitive, the lack of ethnic diversity among them creates a challenge for those who are attempting to provide holistic care to an increasingly diverse group of patients. Holistic care is a term often used in nursing that means to care for patients in their entirety: body, emotions, mind, and social and cultural, environmental, and spiritual aspects.

To develop an effective and therapeutic relationship with a patient, a nurse must establish trust and respect with the patient. Acknowledging a patient’s individual cultural perspective is an important part in establishing this trust. Misunderstanding cultural differences can be a barrier to effective health care intervention and can even cause harm. This is especially true when a health care professional misinterprets or overlooks a patient’s perspectives or that difference from those of the health care professional.

Cultural Encounter as Workplace Stressor

Workplace stress has been defined as “the physical and emotional outcomes that occur when there is disparity between the demands of the job and the amount of control the individual has in meeting those demands.” Stress may occur when nurses are unable to provide the kind of care that is expected of them. If nurses are unprepared to deal with cultural differences in the workplace, a stressful situation can result.

The presence of workplace stressors not only affects the delivery and quality of care but also creates unnecessary costs for the institution. When nurses are constantly exposed to stress, absenteeism increases and employee turnover may result, both of which can have a significant financial impact on the organization.

Family and Cultural Sensitivity

Family support during illness has unique meanings across cultures that help maintain integrity within the extended family, especially in an unfamiliar environment with norms and values that differ from those of the family. In caring for patients and interacting with families, nurses must demonstrate cultural sensitivity, respect diverse practices and beliefs, and understand how cultural differences might alter the way care is provided.

In some cultures, it is considered a moral responsibility for a family member to be by a patient’s side and to provide care. In some cultures, it is considered a moral responsibility for a family member to be by a patient’s side and to provide care.

Communication Across Cultures

Sensitivity to cultural needs, beliefs, and values, including in communication, is essential for nursing interventions to be effective. Communication is the central factor in providing transcultural care. One of the most obvious challenges occurs when a nurse and a patient do not speak the same language. Non-native English-speaking patients or nurses may have to process English conversation in their native tongue—interpreting word for word, thinking in their native tongue, and then trying to make sense of their thoughts before expressing them.

In the meantime, there may be an uncomfortable silence and a delay in response, which the patient may misinterpret.

It is difficult to give timely care when the nurse has to look for a certified interpreter at the hospital. Nailon studied the experiences of Emergency Department (ED) nurses when dealing with non-English-speaking Latino patients. She found that there was often a delay in care because nurses had to interrupt their nursing assessment to look for a translator who was not always available. Sometimes the nurses checked vital signs and reviewed the test results, choosing to secure a translator later when a physician would be ready to assess the patient. The nurses expressed their concern that care was delayed because of a lack of interpreters, especially in a setting with a great many patients requiring acute care. It was also a concern that nurses were using family members as interpreters, because patients might have withheld some information because they knew that it could affect their relationship to the family. Other times, nurses did not use telephone translators, even when such aid was readily available; instead, they tried to communicate using their limited Spanish vocabulary. Sometimes nurses would ask a staff member...
who was not formally trained to interpret. Using an interpreter who is not formally trained may result in inaccurately interpreted messages; if nurses cannot verify patient responses, there is no assurance that the message was accurate.

Another way of communicating cultural needs among staff is through a patient’s medical record (charting). Such documentation can help promote cultural sensitivity and foster continuity of care.16

Theoretic Perspective

Generally, the provider’s attitudes and personal biases are the primary barrier to culturally competent care. Several conceptual frameworks have been proposed to support the development of greater cultural sensitivity in delivery of health care.12,17–19 The common denominators among these models and frameworks include gaining self awareness, checking for personal biases, avoiding the tendency to stereotype, and refraining from discrimination. An introspective examination of this kind is, of course, challenging, especially for health care professionals who have limited transcultural experience or have not been trained in dealing with cultures different from their own.

In developing the ACCESS (assessment, communication, cultural negotiations and compromise, establishing respect, sensitivity, and safety) model for providing health care, Narayanasamy20 explored nurses’ responses to the cultural needs of their patients. Nurses were asked to give an example of a nursing situation in which cultural care was given. On the basis of the data, Narayanasamy reported that the nurses tended to associate cultural needs with food or religion. Even though the study suggested that nurses recognize cultural needs and that they actively practiced culturally sensitive care, such care was interpreted within a more narrow understanding.20

Research Question

Our study built on the work of Narayanasamy20 in 2003, in that we wanted to gain a greater understanding of nurses’ cultural awareness by asking nurses to describe their own experiences with diverse patients and families. Specifically, the aim of our study was to explore how nurses know how to care for patients from cultures different from their own. Given the growing diversity of our patient population, we sought to clarify what nurses draw on in taking care of patients from multiple cultures. We hypothesized that many of the ways they do so are drawn from personal or professional experience and exposure to other cultures, as well as from formal education.

Methods

We developed a questionnaire to inquire how nurses responded to transcultural encounters. It included multiple-choice, fill-in-the-blank, and open-ended questions (Figure 1). This format invited nurses to speak for themselves about what they saw as culturally important and unique experiences. (The responses to the multiple-choice and fill-in-the-blank questions are reported here; the open-ended responses will be reported in a subsequent article.)

Approval for the study was obtained from both the KP Northern California institutional review board (IRB) and the IRB of the university...
in our service area. Questionnaires were distributed to 250 registered nurses from KP Santa Clara Medical Center. Nurses were recruited from all shifts and units (including the ED, critical care, pediatrics, maternal and child, medical surgical, telemetry and step-down units, and the perioperative department). A letter of information was attached to the questionnaire, outlining the purpose of the study, explaining that respondents would remain anonymous, and inviting participants to return their completed surveys to a designated box on each unit.

Results
One hundred eleven nurses completed the survey—a response rate of 44.4%. Four of the items on the questionnaire (items 1, 2, 5 and 6) were multiple-choice and fill-in-the-blank questions. Item 1 invited participants to reflect on “what they draw on” when they are caring for someone from a different culture (Figure 2). The questionnaire provided multiple possible answers; participants were asked to circle all answers that applied and to add other answers of their own. A large majority of the respondents reported that they drew on prior experience, including experience with friends and family, and on their education and training; more than half also included travel experience and information gained from the Internet or the news media.

Participants were also asked to enumerate the different cultures, communities, or ethnicities represented by the patients they had cared for (Table 1). Although some respondents identified broad ethnic categories (Caucasian, Asian, African American, and Hispanic), the specificity and breadth of the responses given were unexpected and remarkable. Participants identified unique, highly specific groups or ethnicities, including Croatian, Russian, East Indian, Korean, Tibetan, Yapese, Hmong, Nigerian, Ethiopian, Brazilian, Nicaraguan, Cuban, and Colombian. Furthermore, their responses revealed that these nurses understood culture as going beyond ethnicity to religious groups, sexual orientation, and social class (eg, homeless). In this article, we have chosen to fully report the wide range of responses that participants listed.

We suspect that this breadth and specificity reflects a population of nurses who are particularly socially and culturally sensitive, who recognize the unique attributes of patients beyond broad categories of ethnicity or race. We do not know if a similar specificity and breadth of responses would be obtained if our questionnaire were given to different health care professionals or administered in more rural or more socially conservative communities.
and agencies. However, this might be an interesting area to investigate in a future study.

In item 5, participants were asked to identify (without any prompts) what resources had proved helpful in caring for patients from other cultures. Respondents reported that interpreters, ethnically diverse coworkers, patients and their families, have been especially helpful to them. The range of resources cited by the respondents indicate that they appreciate the variety of resources that have influenced their care, including verbal and nonverbal communication mechanisms, charting, and other coworkers, such as clergy and social workers (Table 2).

Finally, the nurses were asked what else they felt they needed to be able to provide more culturally competent care. Limited choices were provided for this item, and respondents were asked to circle as many as were relevant and to add other needs. Seventy-seven percent (86 respondents) reported that they wanted more training and continuing education on culture; 63% (71) said that there should be more interpreters. Respondents also perceived more “exposure to more diverse cultures,” as well as reading materials, as potentially helpful. When nurses were asked what would help them provide culturally competent care, a significant number of respondents agreed that training and continuing education would be helpful (Figure 3). Additionally, >50% of the respondents replied that interpreters, exposure to more diverse cultures, and reading materials would help them give culturally competent care.

**Discussion**

In this study, we were inspired to address some of the concerns raised in the Sullivan Commission Report concerning potential health disparities resulting from the lack of a diverse and culturally competent workforce. Our patient population, especially in Santa Clara, is unusually diverse, and our nursing workforce, although also ethnically varied, does not yet reflect the extent of the diversity of our patient population.

In our study, we invited nurses from all inpatient units at the Santa Clara...
Clara inpatient facility to share their experiences in working with diverse populations. Specifically, we addressed the questions “What do nurses draw on when caring for patients and families who are from a culture different from their own?” “How do nurses know what to do when caring for a diverse patient population?” “What resources have been helpful to them in these kinds of situations?” “What other resources do nurses believe would be helpful in increasing their cultural competence?” These are critical questions to answer if we are to meet the goals of the Sullivan Commission. We have reported here our findings from the descriptive portion (multiple-choice and fill-in-the-blank items) of the study.

Study participants reported working with an unusually broad and detailed range of cultures, and their responses revealed that many of the nurses understand culture as extending far beyond broad ethnic categories (white, black, Hispanic, Asian), to include individuals from specific, less common cultures, social groups, religions, and social class. We suspect that this reflects a unique level of cultural sensitivity and awareness. We do not know if a similar response would come from other health care professionals, from nonurban centers, or from more conservative states. Sampling from only one facility in one geographic setting is clearly a drawback, and we would recommend that this investigation be extended into other geographic and political regions.

In this study, we asked nurses to identify the resources that they find themselves drawing on when caring for a patient of a culture different from their own. Their responses confirmed our hypothesis that nurses are drawing heavily on prior experience, including family experiences and experiences with friends and coworkers from different cultures; a large majority also reported that they drew on their training and education, which suggests that schools of nursing are providing valuable preparation for working with diverse populations. A controlled, statistical study measuring the impact of such training on their graduates would be a worthy area of inquiry for schools of nursing.

The participants in this study found certain resources very helpful, including coworkers, translators, clergy, and communication by documentation in medical records. However, what stands out when one looks at the question of necessary resources is the very clear message that nurses want more continuing education and more translators. These are areas where health care agencies can follow up immediately. We can expand translation services. We recommend that efforts be directed toward identifying the educational interventions and continuing-education approaches that are most effective in fostering cultural sensitivity. The participants in this study specifically indicated that more experience with diverse cultures would be especially helpful.

A significant limitation of our research is our purposeful decision to not include a demographic questionnaire because we wanted to make our study anonymous, thereby encouraging participants to be completely honest in their responses. Later, as we were analyzing the data, we found that it would have been especially helpful to know whether the cultural, linguistic, and educational characteristics, age, or religious ties of respondents were related to their perceptions and experiences.

Study respondents also brought rich, open-ended descriptions of...
their transcultural experiences with patients, their insights, and their challenges. The qualitative responses reveal an amazing breadth and depth of cultural sensitivity and creativity as well as the frustrations and challenges in addressing language, behavioral, and familial differences. These findings will be reported in a future article.

Disclosure Statement
The author(s) have no conflicts of interest to disclose.

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

References

The Great Army
You belong to the great army of quiet workers, physicians and priests, sisters and nurses, all over the world, the members of which strive not, neither do they cry, nor are their voices heard in the streets, but to them is given the ministry of consolation in sorrow, need, and sickness.
— William Osler, MD, 1849 – 1919, physician, clinician, pathologist, teacher, diagnostician, bibliophile, historian, classicist, essayist, conversationalist, organizer, manager and author
Laparoscopic Repair of Incisional and Other Complex Abdominal Wall Hernias

Randall O Craft, MD
Kristi L Harold, MD

Abstract

Incisional hernia is one of the most common complications of abdominal surgery, with a reported occurrence rate of up to 20% after laparotomy. The high incidence of hernia formation significantly contributes to both patient morbidity and health care costs. Although a variety of approaches have been described to repair these defects, historically the results have been disappointing. Recurrence rates after primary repair have been reported to range from 24% to 54%. The recent advent of laparoscopic ventral hernia repair (LVHR) has offered promising outcomes by combining tension-free repair using a prosthesis with minimally invasive techniques, lowering reported recurrence rates to <10%. This review discusses standardized, well-researched techniques that have contributed to the success of LVHR. We also discuss how these techniques have been modified for laparoscopic repair of suprapubic lumbar hernias, hernias near the iliac crest, and parastomal hernias. In addition, we review our own experience with LVHR in the context of the principles discussed.

Incisional Hernias

Current approaches for LVHR are based on the open, preperitoneal technique described by Stoppa and Rives et al. Placement of a large prosthesis in the preperitoneal space allows for intraabdominal force to be dispersed over a greater surface area, which may contribute to the strength and durability of the repair. Although the incorporation of mesh has greatly reduced the number of recurrences after repair of incisional hernias, the results are technique dependent. Essential to the success of the laparoscopic approach is adequate mesh fixation. Current approaches to LVHR in North America involve fixation of the mesh with permanent transabdominal sutures and tacks. Experimental studies have also demonstrated the superiority of transabdominal sutures compared with tacks alone. Experimental studies have also demonstrated the superiority of transabdominal sutures compared with tacks alone. Both absorbable

Incisional hernia is one of the most common complications of abdominal surgery, with a reported occurrence rate of up to 20% after laparotomy. The high incidence of hernia formation significantly contributes to both patient morbidity and health care costs. Although a variety of approaches have been described to repair these defects, historically the results have been disappointing. Recurrence rates after primary repair have been reported to range from 24% to 54%. The recent advent of laparoscopic ventral hernia repair (LVHR) has offered promising outcomes by combining tension-free repair using a prosthesis with minimally invasive techniques, lowering reported recurrence rates to <10%. This review discusses standardized, well-researched techniques that have contributed to the success of LVHR. We also discuss how these techniques have been modified for laparoscopic repair of suprapubic lumbar hernias, hernias near the iliac crest, and parastomal hernias. In addition, we review our own experience with LVHR in the context of the principles discussed.

Randall O Craft, MD, is a Chief Resident in the Department of Surgery, Mayo Clinic Arizona, Phoenix, AZ. E-mail: randycraft@mac.com.
Kristi L Harold, MD, is an Associate Professor of Surgery in the Department of Surgery, Mayo Clinic Arizona, Phoenix, AZ. E-mail: harold.kristi@mayo.edu.
and permanent sutures had greater fixation strength than metallic tacks, although absorbable sutures had a significant loss of strength compared with permanent sutures at eight weeks. Subsequent clinical series have shown early recurrences when metallic tacks alone were used for fixation, leading to advocacy of additional transabdominal sutures for repair.

In our experience, adequate mesh coverage is also essential for a durable hernia repair. For our laparoscopic repairs, we begin by establishing a pneumoperitoneum of 15 mmHg using a Veress needle in the left upper quadrant. The abdomen is entered under direct visualization with the Optiview bladeless trocar (Ethicon Endo-Surgery, Somerville, NJ, USA). A minimum of two additional 5-mm trocars are introduced in the left flank. A complete adhesiolysis of the abdominal wall, possibly the most difficult part of the procedure, is performed. Rudmik et al calculated an overall risk of enterotomy of 2.1%. Once adhesiolysis has been completed, full visualization of the abdominal wall provides an additional technical advantage of LVHR over OVHR, with small fascial defects (“Swiss cheese”) being fully visible and covered with the prosthesis. We plan a 4- to 5-cm overlap of mesh beyond all areas of fascial defect. To ensure accurate mesh sizing, we measure the fascial defect size internally with a metric ruler. The fascial edges are marked with spinal needles and the true defect size is determined (Figure 1). This avoids overestimating the size of the defect and subsequently the size of the needed mesh, which can happen when the defect is measured externally because of differences in patient abdominal wall thickness and contour.

With proper technique, the outcomes of LVHR have been shown to be excellent, with a low recurrence rate. Heniford et al reported their experience with 850 consecutive LVHRs using the standardized techniques just described. After a mean follow-up period of 20.2 months, the hernia recurrence rate was 4.7%. Their series also demonstrated a moderate complication rate (13.2%) and an average hospital stay of 2.3 days. One of the theoretic disadvantages of LVHR is that the hernia sac is left in place, leading to a greater incidence of seroma formation. In the series of Heniford and colleagues, only 2.6% of patients experienced seromas that persisted for more than eight weeks or caused symptoms requiring aspiration. Infection does not generally occur in these collections, regardless of whether they are aspirated immediately or are allowed to persist beyond eight weeks.

Our practice has extended these outcomes to include a significantly older population. In our review of 97 patients with a mean age of 68.5 years who underwent LVHR within a four-year period, the recurrence rate was reported as 2%, with low morbidity. We have also reviewed our experience with LVHR in patients who have undergone organ transplantation and are receiving maintenance immunosuppression. When they were compared with a cohort of patients who had not undergone transplantation, the recurrence rates were similar (7.9% and 2.9%, respectively; p = 0.1380) with no increase in morbidity.

**Suprapubic Lumbar Hernias and Hernias Near the Iliac Crest**

Historically, periosteal suture fixation has been used to secure the mesh during suprapubic hernia repairs. However, studies have shown that lack of secure fixation of mesh in the suprapubic position has led to an increased rate of recurrence in LVHR. The lack of fascia in this location has generated a need for an alternative method for secure fixation. Bone anchors have been safely used in orthopedic surgery for many years, and the pull-out strength of suture bone anchors is superior to that of simple periosteal suture fixation. Suture bone anchors allow a firmer attachment of the mesh to stronger bony or ligamentous structures, as opposed to muscle at the hernia’s border. A previous study...
described ten patients with lumbar hernias repaired in an open fashion with bone anchor fixation to the iliac crest, resulting in no recurrences during a 40-month follow-up period. Those results prompted the use of bone anchors for suprapubic hernias as well, because recurrences tend to be at the inferior location over the pubic bone. Our practice for suprapubic hernias is placement of a three-way Foley catheter to allow saline to be instilled into the bladder to aid in its identification during dissection. The entire preperitoneal space is dissected to identify the pubis, the Cooper ligament bilaterally, and the inferior epigastric vessels. This allows for placement of the mesh with good overlap and avoidance of neurovascular injuries. The mesh can then be secured to the Cooper ligament with tacks and secured with additional bone anchors placed in the pubis. The same type of anchors can be applied for hernias near the anterior iliac spine (Figure 2). In our series of 30 patients who underwent LVHR with at least one bone anchor, the recurrence rate was 6.7% after a mean follow-up period of 13.2 months (range, 1–26 months). The complication rate was moderate (7 patients; 23.3%), with a mean length of stay of 5.2 days (Figures 3 and 4).

**Parastomal Hernias**

Parastomal hernias present a particularly challenging problem because the stoma itself must remain a defect despite repairing the hernia. Traditional surgical management has consisted of local tissue repair, stoma relocation, or placement of a prosthetic mesh. Hernia recurrence rates for primary fascial closure are reported to range from 46% to 100%. Stoma relocation is reported to have a hernia recurrence rate of 36% (range, 0%–76%). But may require an additional laparotomy. Open repair with polypropylene mesh has improved these outcomes, but it is still associated with a failure rate of 26% to 29%. Overall complication rates of up to 88% combined with a growing number of reports of decreased patient morbidity and improved outcomes with laparoscopic tension-free mesh repair of ventral hernias, have led many surgeons to apply these techniques to this difficult problem. Laparoscopic repair has offered an alternative approach, and small series have reported encouraging results. Two main techniques have been employed: keyhole and Sugarbaker.

Paul H Sugarbaker was the first to describe the placement of intraperitoneal mesh for the repair of parastomal hernias. His technique involved placing a piece of mesh around the fascial defect and securing it circumferentially, except laterally where the colon exited the abdominal cavity to create a mesh flap valve around the stoma to help prevent further herniation.
He advocated laparotomy for placement of the mesh to avoid contact with the stoma bud and thus reduce infection. In his series of six patients, there were no recurrences or mesh-related complications after four to seven years of follow-up monitoring. In contrast, with the keyhole technique, a 2- to 3-cm keyhole defect is created in the mesh to accommodate the ostomy without the creation of a flap valve as described by Sugarbaker. Additional interrupted sutures are placed intra- or extracorporeally along the linear defect in the mesh leading away from the ostomy. We have employed both the Sugarbaker and keyhole techniques in our laparoscopic approach to parastomal hernia repairs.

Early in our own experience, we performed the keyhole technique, but we currently prefer the Sugarbaker approach. In our experience as well as that of others, the Sugarbaker technique has been found to be technically less demanding, associated with decreased surgery duration, and decreased recurrence rates.

Although the laparoscopic approach to the repair of parastomal hernias is relatively novel, several series have been reported that had promising short-term results. Mancini et al reported results from their series of 21 laparoscopic parastomal hernia repairs. Mean defect size was 130 cm² (range, 25–416 cm²), and the mean hospital length of stay was 3.3 days. During a median follow-up period of 19 months (range, 2–38 months), 4% (1 of 25) of the patients experienced recurrence. We have recently reported our own series of 21 laparoscopic parastomal hernia repairs (9 urostomies, 7 ileostomies, and 5 colostomies). The mean defect size was 130 cm² (range, 25–416 cm²), and the mean mesh size was 440 cm² (range, 240–780 cm²). All repairs were successfully completed laparoscopically. Mean duration of surgery was 210 minutes (range, 99–326 minutes). Two patients required mesh removal because of infection. The duration of follow-up monitoring ranged from 1 to 17 months (mean, 6 months). There have been no recurrences.

Laparoscopic parastomal hernia repair seems to offer a good alternative to open repair, with acceptable complication rate and low recurrence in the short term.

**Summary**

Ventral hernia is one of the most common complications after abdominal surgery. Historically high recurrence rates have led to an evolution of techniques from open primary repair, to incorporation of a prosthesis, and most recently to laparoscopic mesh placement. The application of minimally invasive techniques has reportedly led to a more durable repair. LVHR appears to offer superior outcomes in the short term, primarily because of the ability it gives surgeons to provide superior overlap of mesh and the incorporation of transabdominal sutures for fixation. As this approach becomes more widely applied to increasingly complex hernias, the surgeon will have to be aware of techniques that allow for adequate mesh coverage and fixation to ensure optimal outcomes.

**Disclosure Statement**

The author(s) have no conflicts of interest to disclose.

**Acknowledgment**

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

**References**


The Least Troublesome Cure

The prime object of the physician in the whole art of medicine should be to cure that which is diseased; and if this can be accomplished in various ways, the least troublesome should be selected; for this is more becoming a good man, and one well skilled in the art, who does not covet popular coin of base alloy.

— On the Articulations, Hippocrates, c 460 BC – c 370 BC, ancient Greek physician in the Age of Pericles
Successful Treatment with Intravenous Immunoglobulin of Acute Flaccid Paralysis Caused by West Nile Virus

Mohammad Sami Walid, PhD
Fade Aziz Mahmoud, MD

Abstract
West Nile virus (WNV) is one of the leading causes of insect-borne encephalitis and acute flaccid paralysis in the US. Acute flaccid paralysis is a potentially serious illness, which manifests itself as a Guillain-Barré-like syndrome with generalized weakness and shortness of breath. We report a case involving a patient who presented with acute flaccid paralysis due to WNV infection and was successfully treated with intravenous immunoglobulin from Israeli donors.

Introduction
West Nile virus (WNV) is one of the leading causes of insect-borne encephalitis in the US. WNV first outbreak happened in New York City during the sweltering summer of 1999. Since then, seasonal outbursts of febrile illness and neurologic disease caused by WNV have struck across the US. WNV is classified as a member of Flaviviridae, the same family that includes hepatitis C, dengue, and yellow fever. Mosquitoes act as the transmitting vector for the virus, and infected birds, especially corvids (crows and jays), are the reservoir of the disease. They are responsible for spreading the disease across the country by traveling along migration routes. WNV tends to cause severe mortality in birds when it reaches a new area. Humans appear to be incidental hosts; that is, humans are not necessary to complete the disease cycle. South Dakota consistently has one of the highest rates of WNV neuroinvasive disease in the US, as do North Dakota, Nebraska, Kansas, Texas, Arizona, and West Virginia (Figure 1). In 2007, a total of 3630 cases were reported from 775 of the 3142 counties in the US. Of these cases, 65% were West Nile fever, 34% were WNV neuroinvasive disease, and 1% were unspecified clinical


Mohammad Sami Walid, PhD, is a Research Fellow at the Medical Center of Central Georgia, Macon, GA. E-mail: frswalid@yahoo.com
Fade Aziz Mahmoud, MD, is a Hospitalist at Baystate Medical Center at Tufts University School of Medicine in Springfield, MA. E-mail: FadeAziz.MahmoudMD@bhs.org
Case Presentation

A white man, age 55 years, with a medical history of diabetes mellitus and hypothyroidism presented in August 2005 to Sioux Valley University Medical Center in Sioux Falls, South Dakota, complaining of progressive muscle weakness and numbness in all four extremities for the preceding three days. The patient’s cognition was not impaired, and he responded appropriately to questions. Full neurologic examination revealed muscle weakness (Table 1) and hyporeflexia. Laboratory studies revealed a total leukocyte count of 9.2 × 10³/µL; neutrophils, 77%; hemoglobin, 13.5 g/dL; and a platelet count, 208 × 10³/µL. Findings from renal and hepatic panels were unremarkable. Lumbar puncture revealed a leukocyte count of 3 leukocytes/mm³ (16% neutrophils, 45% lymphocytes, and 37% monocytes), a slightly elevated glucose level (133 mg/dL), and a normal protein level (47 mg/dL). Cerebrospinal fluid Gram stain and cultures were negative. Magnetic resonance images of the spine showed some degenerative changes from C4 to C6, with mild impingement of the cord that did not explain the quickly developing muscle weakness. Findings on both computed tomography and magnetic resonance imaging scans of the brain were negative.

The weakness continued to progress until the patient developed difficulty swallowing and shortness of breath on the third day. The patient was transferred to the intensive care unit and placed on ventilator. Neurologic examination revealed worsening muscle strength and absence of reflexes in all four extremities. Guillain-Barré syndrome was suspected, given the progressive nature of the patient’s muscle weakness, dysphagia, and hypoxia. Plasmapheresis and dexamethasone were administered. Nerve-conduction studies revealed severe, diffuse, sensorimotor mixed polyneuropathy that was predominantly axonal in nature. Despite plasmapheresis and corticosteroid therapy, the patient’s condition continued to deteriorate, with no improvement in muscle strength. By the sixth day, immunoglobulin M antibodies for WNV were detected in the serum. AFP secondary to WNV infection was considered; corticosteroids and plasmapheresis were stopped by the infectious diseases specialist.

| Table 1. Muscle strength and reflexes before and after IVIG therapy |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| D1  | D2     | D3     | D4     | D5     | D8     | D9     | D10    | D11    | D12    | D28    |
| RUE MS 4/5 | 2/5 | 1/5 | 1/5 | 0/5 | 0/5 | 1/5 | 1/5 | 3/5 | 3/5 | 4/5 |
| REF +1 | +1 | 0 | 0 | 0 | 0 | +1 | +1 | +1 | +1 | +1 |
| LUE MS 3/5 | 3/5 | 1/5 | 1/5 | 0/5 | 0/5 | 1/5 | 1/5 | 3/5 | 3/5 | 4/5 |
| REF +1 | +1 | 0 | 0 | 0 | 0 | +1 | +1 | +1 | +1 | +1 |
| RLE MS 4/5 | 3/5 | 0/5 | 0/5 | 0/5 | 0/5 | 2/5 | 4/5 | 4/5 | 4/5 | 4/5 |
| REF +1 | 0 | 0 | 0 | 0 | 0 | +1 | +1 | +1 | +1 | +1 |
| PLA No | No | No | No | No | No | No | No | WNL | WNL | WNL |
| LLE MS 4/5 | 2/5 | 0/5 | 0/5 | 0/5 | 0/5 | 0/5 | 2/5 | 4/5 | 4/5 | 4/5 |
| REF +1 | 0 | 0 | 0 | 0 | 0 | +1 | +1 | +1 | +1 | +1 |
| PLA No | No | No | No | No | No | No | No | WNL | WNL | WNL |

Plasmapheresis was started on day 3 after admission and stopped on day 6.
IVIG was started on day 8 after admission.
IVIG = intravenous immunoglobulin; LLE = left lower extremity; LUE = left upper extremity; RLE = right lower extremity; RUE = right upper extremity; MS = muscle strength; PLA = plantar reflex; REF = tendon reflexes; WNL = within normal limits.
Successful Treatment with Intravenous Immunoglobulin of Acute Flaccid Paralysis Caused by West Nile Virus

DISCUSSION

WNV is a potentially serious illness. It can present itself clinically in a way indistinguishable from Guillain-Barré with generalized weakness and shortness of breath.8 On electromyography, however, patients often exhibit nerve-conduction velocities consistent with both axonal and demyelinating lesions.9 Axonal changes are usually more prominent, findings unusual for Guillain-Barré syndrome. Our patient’s nerve-conduction studies revealed severe, diffuse, mixed polyneuropathy that was predominantly axonal in nature. Moreover, it should be noted that in differentiating our patient’s condition from Guillain-Barré, we found the cerebrospinal protein level to be normal.

Treatment for WNV infection is mainly supportive. Ribavirin in high doses and interferon-α-2b were shown to inhibit WNV replication in vitro, but inconsistent results have been shown in vivo.10,11 The success of IVIG in other viral diseases made it the best new option to consider in our case.12 Animal studies show that IVIG provides full protection and recovery from WNV infection by antagonizing the WNV glycoproteinous envelope that mediates virus-cell contact.13 Being the most immunologically provocative structural protein, the viral envelope triggers virus-neutralizing antibodies that prevent the viral infection of the host’s cells by targeting the epitopes included in the glycoproteinous envelope.

There are few reports in the literature about the use of IVIG in cases of WNV encephalitis.5–7 IVIG contains a high titer of anti-WNV antibodies (1:1600). Recently, OMRIX Biopharmaceuticals of Israel developed a strategy for the selection of plasma units from the 10% fraction of blood donors containing WNV antibodies. Positive units were processed into the pharmaceutical grade WNV IVIG (WNIG). WNIG is at least 5- to 10-fold more potent than regular Israeli IVIG.14

Remarkable improvement resulted from the use of IVIG despite its late administration (eight days after admission). Intrathecal administration of immunoglobulin has been reported in other infections with no complications and should probably be considered in patients with WNV as well.15 Currently, a multicenter phase I/II clinical study is being conducted by OMRIX Biopharmaceuticals and the National Institutes of Health with WNIG, which has been given the “orphan drug” status by the Food and Drug Administration. More research is needed to study the optimal timing, dosage, and route of administration of this immunoglobulin in serious cases of WNV infection.

Immunoglobulin may be the first line of treatment in any patient with AFP suspected of having WNV infection, which should be differentiated from Guillain-Barré syndrome with the help of nerve-conduction tests, lumbar puncture and serological studies.

REFERENCES


The Permanente Journal/ Summer 2009/ Volume 13 No. 3
Primary Infection

What seems to be clear to me is that after the primary infection most of the cells die indirectly, but at the later stage, when the viral load is very high, the virus kills a lot of cells directly.

— Luc Montagnier, b 1932, French virologist, 2008 Nobel Prize recipient in Physiology or Medicine for his co-discovery of Human Immunodeficiency Virus
Image Diagnosis: Abnormal Plain Films from the Emergency Department

Gus M Garmel, MD, FACEP, FAAEM

Case 1. Soft tissue lateral neck x-ray demonstrating acute epiglottitis.

The epiglottis is swollen and looks like a thumbprint (thumbprint sign) at the level of the hyoid bone. A normal epiglottis in a true soft tissue lateral neck is thin. The epiglottis can be directly visualized using nasopharyngoscopy or direct laryngoscopy in skilled hands. Because of the Haemophilus influenzae type b (HIB) vaccine and herd immunity, this condition is relatively rare in children. It may still occur in adults, although it tends to result in less airway compromise because the adult airway has a larger diameter. Despite this, epiglottitis remains an airway emergency, requiring close observation and potential emergent airway intervention.

Case 2. Plain abdominal film (erect) demonstrating free air under both hemidiaphragms.

A small sliver of free air (black) is seen on close inspection directly under the diaphragms in this upright film. In the appropriate clinical setting, a patient with abdominal pain and free air on plain film is an ominous sign. Free air may be present in postoperative patients and has been reported following vigorous sexual activities.
Corridor Consult

Acute Phosphate Nephropathy

Antoine Abcar, MD
Aviv Hever, MD
Jasminder S Momii, MD
John J Sim, MD

Introduction

Acute phosphate nephropathy (APN) is an underrecognized cause of both acute and chronic renal failure. Individuals with decreased renal function who are exposed to high doses of phosphorous are susceptible to developing APN. The risk for APN is increased in patients with underlying chronic kidney disease, older age, and female sex and in patients taking angiotensin-converting enzyme inhibitors, angiotensin-receptor blockers, diuretics, or nonsteroidal anti-inflammatory drugs (NSAIDs). APN has been reported to occur after exposure to sodium-phosphate (NaP) bowel-cleansing solutions. Clinically, some patients may present acutely with severe elevations of serum phosphorous and acute kidney injury (AKI); however, the injury may take weeks after exposure to occur, or the finding of an elevated creatinine level may be discovered incidentally weeks or months after the ingestion of these bowel preparations. Therefore, a careful history is important for making this diagnosis. Renal biopsy demonstrates deposition of calcium and phosphorous with damage in the tubulointerstitium. Patients may have variable outcomes, with some having no recovery of renal function and others recovering some function. There is no particular intervention that can be instituted once the nephropathy occurs. Avoidance of NaP-based bowel-cleansing solutions, particularly by high-risk individuals, is key to preventing APN.

Case Example

Your patient calls to inquire about taking a bowel preparation called Visicol. The patient is due to have her routine screening colonoscopy done and was instructed to take Colyte beforehand, but she states that many of her friends have had difficulties with Colyte because of its taste and that she had heard that Visicol was much easier to take. She is concerned that she will not be able to tolerate taking Colyte. The patient is a Caucasian woman, age 51 years, with hypertension, hypercholesterolemia and type 2 diabetes mellitus. Results of her most recent laboratory test two months earlier reveal a serum creatinine level of 1.4 mg/dL. Her estimated glomerular filtration rate (GFR), based on the abbreviated modifications of diet in renal disease formula, is 42 mL/min/m². Her medications include lisinopril, hydrochlorothiazide, and glipizide. At her most recent office visit, her blood pressure, diabetes, and cholesterol were noted to be in good control. She occasionally takes over-the-counter ibuprofen for headaches.

Discussion

Protocol Choices

There are many protocols used in preparing patients for colonoscopy. Stimulant laxatives had been used in the past but are not commonly used today because of their potential adverse effects, such as upset stomach, vomiting, irritation, stomach cramping, and rectal bleeding. Hyperosmotic laxatives such as mannitol or sorbitol have also been used in the past. There is a theoretical risk of explosion with these preparations because of the hydrogen gas produced by the fermentation of the unabsorbed carbohydrates in the bowel and are thus used less routinely.

Currently, the method most commonly used is a balanced-electrolyte solution, such as the polyethylene glycol (PEG) in Colyte. The main complaint from patients in using this preparation has been its taste and the large volume of the solution used in the preparation for their procedures. There have been variations on this preparation in an attempt to improve the taste and thus improve patient compliance with these protocols. They remain the most commonly used preparation for endoscopic bowel procedures.

The other type of bowel preparation includes saline laxatives. They contain magnesium or phosphate ions,
which are hyperosmotic, causing water to shift into the bowel lumen and stimulating peristalsis. The most commonly used formulation in this category is Fleet Phospho Soda, which is in a liquid form compared to Visicol which is a tablet formulation. Some studies have shown saline laxatives may be superior compared to balanced-electrolyte solutions such as PEG because patients comply more with saline laxatives and incur less nausea, vomiting, and bloating. The most commonly used formulation in this category is Fleet Phospho Soda, which is in a liquid form compared to Visicol which is a tablet formulation. Some studies have shown saline laxatives may be superior compared to balanced-electrolyte solutions such as PEG because patients comply more with saline laxatives and incur less nausea, vomiting, and bloating.5 The protocol entails taking 3 tablets with 8 ounces of clear liquid every 15 minutes, for a total of 20 tablets 12 hours before the procedure. This is repeated at three and five hours before the procedure.5

The main concern with the use of laxatives containing sodium phosphate is an acute increase in serum phosphate levels, which may result in an acute calcium phosphate deposition, followed by AKI.6 Other possible acute problems include volume depletion, hypocalcemia, and hypernatremia. The increase in serum phosphate levels is clinically insignificant in most patients, but patients with preexisting renal disease may be at greater risk for its consequences.7 Patients at risk are those with GFR < 50 mL/min. These protocols can also cause significant electrolyte abnormalities and may lead to hypocalcemia, hypernatremia, and hypomagnesemia.1 They also have been associated with seizures and alteration in colonic mucosa that can mimic changes seen with NSAIDs or inflammatory bowel disease.

Renal Manifestations

The type of renal injury caused by these agents has been termed acute phosphate nephropathy (APN). Although patients at highest risk remain those with preexisting renal disease, it is important to realize that APN can occur in patients with normal renal function as well.

The histology in APN reveals diffuse renal deposition of calcium phosphate precipitants along with tubulointerstitial damage4 (Figure 1). The deposition occurs in the tubular lumen, interstitium, or both. Clinically, patients may present with low-grade proteinuria (usually <1g/d). Elevated serum creatinine may be seen immediately after bowel prep, along with acute elevations in serum phosphate levels. However, some patients may develop AKI weeks after exposure, thus making the diagnosis more difficult and likely underrecognized.

The outcome of APN is highly variable and depends mostly on baseline renal function. There has been speculation that genetic factors may also play a role in susceptibility to APN. The disorder may be more common in women, Caucasians, patients with diabetes, and individuals age 55 and greater.1 In May 2006, the US Food and Drug Administration (FDA) issued an alert cautioning against using oral NaP in high-risk patients.8 Clinicians should weigh the risks of using NaP bowel preparation agents against the benefits in the following subgroup of high-risk patients: those with hepatic or renal insufficiency, patients with congestive heart failure, patients older than 55 years, patients with volume depletion or hypercalcemia, and patients taking drugs that affect renal perfusion, such as NSAIDs, angiotensin-converting enzyme inhibitors, angiotensin-receptor blockers, and diuretics.8 Withholding these medications immediately before and after the procedure should be considered to minimize risk of APN.

In December 2008, the FDA issued another alert regarding the use of oral NaP products. It required

The outcome of APN is highly variable and depends mostly on baseline renal function.
that the manufacturers of Visicol and OsmoPrep add a boxed warning to the labeling of their products and recommended against the use of over-the-counter oral NaP products (such as Fleet Phospho Soda) for bowel cleansing in preparation for endoscopic procedures unless the products are directly prescribed by a health care professional.9

Case Resolution

The patient under consideration here has many potential risk factors for APN. Her primary risk factors are age, chronic kidney disease, and sex.10 Furthermore, she is taking medications that may increase her risk of APN: specifically ibuprofen and lisinopril/hydrochlorothiazide. For these reasons, she should be advised against taking phosphate-containing bowel preparations and be counseled to use a standard PEG solution. If she refuses, an informed decision should be made regarding phosphate-containing solutions after discussing the risks with the patient. The use of NSAIDs, diuretics, and angiotensin-converting enzymes should be suspended temporarily and other medications should be substituted for controlling blood pressure as needed to minimize risk.

APN is a potentially irreversible consequence of phosphate-containing bowel preparations. The prevalence of APN is likely to be higher than what is reported because many of these patients are not diagnosed or recognized. Given the fact that there are safer alternatives to phosphorous-containing formulations, using phosphorous formulations does not warrant the risk of APN in high-risk patients, particularly in patients with chronic kidney disease. 

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

Acknowledgment

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

References

7. Rys mann S, Lamerato L, Motsko SP, Pezzullo JC, Faber MD, Jones JK. Risk of further decline in renal function after the use of oral sodium phosphate or polyethylene glycol in patients with a preexisting glomerular filtration rate below 60 mL/min. Am J Gastroenterol 2008 Nov;103(11):2707–16.

Filtration

The amount of creatinine present in the urine of man after ingestion of this substance is so large that it requires a filtration of up to 200 cc per min to explain it …

The result is taken to be in favour of the filtration theory.

— Studies of Kidney Function, 1926, Poul Brandt Rehberg, 1895-1989, Danish physiologist and researcher
The Permanente Journal/Summer 2009/VOLUME 13 NO. 3

The Importance of Accurate Blood Pressure Measurement

Joel Handler, MD

Clinical Scenario

A woman, age 72 years, has blood pressures of 150/70 mm Hg and 150/80 mm Hg, obtained by a medical assistant (MA), on consecutive office visits and does not have a history of hypertension. The blood pressure cuff is properly sized, the MA is inquiring about the patient’s last mammogram while obtaining the blood pressure, and the patient is helping to hold her arm up within the MA’s grasp. The mean of a dozen blood pressure readings that the patient has obtained at home is 128/64 mm Hg. Does this patient have white-coat hypertension?

Discussion

The most important commonly performed office test is blood pressure measurement, yet it is considerably undervalued. In the Kaiser Permanente Southern California (KPSC) Region, more than 2,300,000 blood pressure measurements were obtained by office staff in March 2009 (Ralph S Vogel, PhD, personal communication, 2009 April). MAs often work in a rushed atmosphere, and physicians want their patients to be roomed promptly. However, populationwide, small inaccuracies in blood pressure measurement can have considerable consequences. Underestimating true blood pressure by 5 mm Hg would mislabel more than 20 million Americans with prehypertension when true hypertension is present. It has been predicted that the consequences of an untreated 5 mm Hg of excessive systolic blood pressure would be a 25% increase over current levels of fatal strokes and fatal myocardial infarctions for these individuals. Conversely, overestimating true blood pressure by 5 mm Hg would lead to inappropriate treatment with antihypertension medications in almost 30 million Americans, with attendant exposure to adverse drug effects, the psychological effects of misdiagnosis, and unnecessary cost.

The trap is that in acknowledging the consequences of small measurement inaccuracies, errors of 5 to 10 mm Hg commonly occur as a result of improper blood pressure technique. Table 1 lists blood pressure aberrancies as a result of common errors. For example, active listening by the patient, when the MA is talking during blood pressure measurement, can increase systolic blood pressure by 10 mm Hg.

Figure 1. Proper performance of a sitting blood pressure measurement. Note a proper-size cuff over a bare upper arm, which is positioned at heart level and supported on a table; the patient’s back is supported and her feet are on the floor.

Table 1. Blood pressure aberrancies as a result of common errors

<table>
<thead>
<tr>
<th>Error Description</th>
<th>Effect on Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active listening</td>
<td>Increase systolic by 10 mm Hg</td>
</tr>
<tr>
<td>Unsupported arm</td>
<td>Increase systolic by 10 mm Hg</td>
</tr>
<tr>
<td>Lack of back support</td>
<td>Increase blood pressure</td>
</tr>
<tr>
<td>Crossed legs</td>
<td>Increase blood pressure</td>
</tr>
<tr>
<td>Urination</td>
<td>Increase systolic pressure by &gt;10 mm Hg</td>
</tr>
<tr>
<td>Clothing effect</td>
<td>Increase systolic pressure</td>
</tr>
</tbody>
</table>

Terminal Digit Preference

Terminal digit preference, a common source of error during manual blood pressure examinations, is the rounding off of numbers to the nearest zero. Usually the result is an inappropriate increase in the diagnosis of hypertension because systolic pressures in the upper 130s are rounded up to 140 mm Hg. In a KPSC blood pressure survey, 22% of recorded blood pressure numbers ended in zero; the expected occurrence would be 10%. Those results are better, however, than those from one literature survey, which reported that 78% of recorded...
blood pressure numbers terminated in zero.\textsuperscript{7,8} Although studies have been reported showing that an automated oscillometric device that provides five serial blood pressure measurements reduces the white-coat effect compared with manual determinations,\textsuperscript{9,10} another study has shown that blood pressure is underestimated by this device, leading to significant misclassification of hypertension.\textsuperscript{11} The use of an automatic blood pressure monitor does have the advantage of obviating terminal digit preference,\textsuperscript{12} but the plethora of potential patient preparation errors still remain.

Forearm Blood Pressure

What about taking a forearm blood pressure on an obese patient? Nurses often find that it is faster and easier to take a forearm blood pressure than to search for a larger cuff. Studies have shown that forearm blood pressures generally run 3.6/2.1 mm Hg higher than upper arm blood pressures.\textsuperscript{13,14} The experience in KPSC has been that once clinicians and MAs are taught how to obtain forearm blood pressures, inappropriate usage of forearm pressures becomes commonplace. Therefore, we no longer teach this technique. Instead, the regional mandate is to have both standard and large blood pressure cuffs in every primary care examination room. Using a standard blood pressure arm cuff on an obese patient falsely raises systolic blood pressure by approximately 10 mm Hg. “Miscuffing” should be strongly discouraged.

Proper Technique

For which patients is a standing blood pressure measurement most appropriate, and what is the proper technique for obtaining one? Particularly in patients who are ≥70 years old and taking antihypertension medications, obtaining standing blood pressure measurements should be routine practice. Although the sitting blood pressure measurement represents the standard in hypertension treatment trials, standing systolic pressure decreases of ≥20 mm Hg, consistent with a diagnosis of orthostatic hypotension, commonly occur and raise safety and quality-of-life issues in geriatric patients already at risk for dizziness and falling. Therefore, the National High Blood Pressure Working Group report on Hypertension in the Elderly concluded “… if the standing blood pressure is consistently much lower than the sitting blood pressure, the standing blood pressure should be used to titrate drug doses during treatment.”\textsuperscript{15} An international neurology consensus statement endorsed waiting “within three minutes” in the standing position\textsuperscript{16} and others have clarified this recommendation as being three minutes,\textsuperscript{17} but the protocol used in the landmark HyVET trial (HyVET) waited two minutes.\textsuperscript{18} Having patients stand for two to three minutes before their upright blood pressure measurement is taken is reasonable for hypertension management. When blood pressure is properly measured in the standing position, the arm should be supported (Figure 2). When measurement is taken on a dangling arm, the systolic pressure may artifactually be 6 to 10 mm Hg higher than in an arm that is properly supported.\textsuperscript{19,20}

Doctor or Nurse or Medical Assistant

Who should be measuring the blood pressure after all, physician or nurse? In all of the hypertension treatment trials, blood pressure has been measured by trained nonphysicians, usually nurses. White-coat effect is common and persistent. In a classic study of nurse and physician blood pressures undertaken in patients with continuous intra-arterial blood pressure monitoring, two concurrent measurement phenomena were observed: observer effect and alerting reaction (Figure 3). After a few minutes, a repeat blood pressure measurement obtained by both a physician and a nurse produced

### Table 1. Factors affecting accuracy of blood pressure measure

<table>
<thead>
<tr>
<th>Factor</th>
<th>Magnitude of systolic/diastolic blood pressure discrepancy (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talking or active listening</td>
<td>10/10</td>
</tr>
<tr>
<td>Distended bladder</td>
<td>15/10</td>
</tr>
<tr>
<td>Cuff over clothing</td>
<td>5–50/</td>
</tr>
<tr>
<td>Cuff too small</td>
<td>10/2–8</td>
</tr>
<tr>
<td>Smoking within 30 minutes of measure</td>
<td>6–20/</td>
</tr>
<tr>
<td>Paralyzed arm</td>
<td>2–5/</td>
</tr>
<tr>
<td>Back unsupported</td>
<td>6–10/</td>
</tr>
<tr>
<td>Arm unsupported, sitting</td>
<td>1–7/5–11</td>
</tr>
<tr>
<td>Arm unsupported, standing</td>
<td>6–8/</td>
</tr>
</tbody>
</table>

...if the standing blood pressure is consistently much lower than the sitting blood pressure, the standing blood pressure should be used to titrate drug doses during treatment.”\textsuperscript{15}
results about 10/5 mm Hg lower than the first determination, owing to mitigation of the alerting reaction. Nonetheless, there was a difference of 10/5 mm Hg between the physician and the nurse with both the first and second determinations, demonstrating the persistence of the observer, or white-coat, effect. Patients are more afraid of physicians than of nurses. If an initial blood pressure reading obtained by an MA is elevated and a physician then obtains a follow-up reading, that second reading may be lower because the alerting reaction has subsided, or it may be higher because of doctor-related white-coat effect. Physicians taking blood pressure measurements should be knowledgeable regarding proper technique and the causes of artifacts. Multiple competent blood pressure measurements by MAs can obviate the white-coat effect. Two studies have shown that several measurements obtained by nurses can approximate mean blood pressure measurements obtained by 24-hour ambulatory blood pressure recordings. The discrepancy between office blood pressure measurements and 24-hour ambulatory measurements is at least in part because of poor office competence in obtaining accurate readings. When there is concern regarding the possibility of the white-coat effect, having MAs obtain weekly blood pressure measurements for two weeks should be considered. Whenever the first blood pressure reading is elevated, a second reading should be obtained after a one-minute interval.

**Patients**

Patients are increasingly helpful as quality-assurance monitors. Educational materials are available to teach proper home blood pressure measurement technique, and other general patient-education materials demonstrating blood pressure measurement competency have been distributed. On a few occasions, we have received accurate criticism of blood pressure measurement technique performed by our staff from patients in KPSC. Also, peer-validator competency review of blood pressure measurement by MAs is expanding in our system: MAs receiving peer-validator training offer critiques and instruction to their colleagues in a program that has generated positive feedback from participants. Additionally, a new blood pressure measurement training video is being developed, with “train-the-trainer” Webinars planned for later in 2009.

**Conclusions**

The patient whose case was presented at the beginning of this article does not have hypertension despite the elevated office readings, and she does not need home blood pressure measurements for a diagnosis of white-coat hypertension to be made. White-coat hypertension indicates a dissociation between competently determined office blood pressure elevations and normal blood pressure readings obtained at home. Therefore, findings for this patient do not qualify for a diagnosis of white-coat hypertension, because the office blood pressure readings are inaccurate. Terminal digit preference

If an initial blood pressure reading obtained by an MA is elevated and a physician then obtains a follow-up reading, that second reading may be lower because the alerting reaction has subsided, or it may be higher because of doctor-related white-coat effect.
is a marker of inaccurate office technique: all four office measurements for the patient ended in zero. Active listening by the patient, from whom medical information was requested during blood pressure measurement, and partial patient support of her outstretched arm could easily have accounted for a systolic artifact of >10 mm Hg. This patient was exposed to the possibility of receiving an inaccurate diagnosis of hypertension and taking inappropriate antihypertension medications. Her case illustrates potential patient care problems ensuing from poor office blood pressure measuring technique.

Take a minute to examine Figure 4 and list all ten errors in obtaining the sitting blood pressure shown. (Key to answers listed below.)

Practice Leader, Data Consulting and Report Production, Southern California Permanente Medical Group Clinical Analysis

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

Acknowledgment

Katharine O’Moore-Klopf, ELS, of KOK

Edit provided editorial assistance.

References

East Asian Attitudes toward Death—A Search for the Ways to Help East Asian Elderly Dying in Contemporary America

Sok K Lee, MD, MA

Abstract
The art of dying well has been a quintessential subject of ethicoreligious matters among the people in the West and the East. Most of us wish to die at home; however, about 50% of Americans die in acute care hospitals. Furthermore, immigrants from East Asian cultures feel more uncomfortable near death, because their physicians are not familiar with their traditions. This article is written to help American physicians understand the unique aspects of East Asian Confucian Ethics for the better care of the dying elderly. Western attitudes toward death are briefly reviewed and the six East Asian concepts related to death are elaborated from Confucian Chinese philosophy. To widen the horizon of bioethics and to embrace the Confucian wisdom of dying well, three pearls of wisdom from classical Confucianism are proposed: the relational autonomy of family, Confucian creative self-transformation, and the unity of transcendence and the human being.

We will have to give up the notion that death is catastrophe, or avoidable, or even strange.
—Death in the Open, Lewis Thomas

Introduction
Modern Americans die hard. We live longer thanks to new advances in modern medicine, but we die with less equanimity than our grandparents did. We meet our own death with fear and despair because of anticipated pain and the helpless depression of hopelessness of any afterlife. According to Phillippe Aries, French historian, death has gradually become forbidden and unnamable since the second half of the 19th century. In her work on Death and Dying, well-known Swiss psychiatrist Elisabeth Kübler-Ross laments that in this post-modern a-religious and secular society, a few of us die in what she calls the fifth stage of acceptance. During the 1950s and 1960s, advances of medical technology in the US transformed the healing arts into scientific medicine. As evidenced by the summer 2008 issue of The Journal of Clinical Ethics (Volume 19; Issue No. 2), which focused on end-of-life issues, recently there are efforts to recreate a modern version of the medieval *ars morendi*, or art of dying, which includes hospice care, palliative medicine, and advance directives. Nonetheless, approximately 50% of elderly Americans still die in acute hospitals, even though most wish to die in their homes. These patients also die in more pain than not, unnecessarily. With an added cultural barrier, dying East Asian immigrants in the US die in religiocultural distress because of the unfamiliar American attitudes toward death and dying. They wish to die in their homeland. Ethics committees from around the country do not value their unique way of ending life as their own family would prefer, because the bioethical norms of the committee members are inculcated by the principlism proposed by Beauchamp and Childress.

I will briefly review Western attitudes on dying, drawn from the studies of Phillippe Aries, Elisabeth Kübler-Ross and Sandra Gilbert. I will then argue that unique features of East Asian ethics can contribute to American bioethics, highlighting three aspects of Confucian philosophy of death and dying: 1) the relational autonomy of family, 2) Confucian creative self-transformation to sagehood, and 3) the unity of transcendence and human being. These three pearls of dying wisdom are drawn from six Confucian attitudes toward death along with NeoConfucianism of Chu Hsi up to that of a New Confucian, Tu Wei-Ming.
Western Attitudes Toward Death

“In the 1850s, Western society had witnessed a brutal revolution. Death, so omnipresent in the past that was familiar, would be effaced. It would become shameful and forbidden,” wrote the French historian, Phillipe Aries. Beginning in the 1950s, people died away from home primarily in hospitals, receiving intensive medical care. Physicians, the *masters of death*, sanitized dying, and made it more “acceptable” to the survivors of the deceased. The dying person is separated from family and home, and is seldom aware of his/her rights on how and where to die. Physicians do not know when to pronounce death for comatose patients unless they rely on electroencephalography and its interpretation by a neurologist for brain death. The survivors are then expected to recover from grieving as quickly as possible, and any prolonged grief becomes a suspicious sign of depression. Death is forbidden and avoided as much as pornography, according to Geoffrey Gorer. This trend is more pronounced in European countries than in the US. Phillipe Aries marvels at the American funeral traditions, which seem more traditional and euphoric than its European counterparts.

In Europe, there are more cremations and visiting gravesites is rare. Aries longs for the renewal of the medieval understanding of tamed death or *one’s own death*. This, then, evolved into *thy death*, which JudeoChristians embrace in their belief that God gives us a convincing reason to accept death through an embrace of religion. Aries asks if “our technological culture could ever regain the naïve confidence in Destiny which had for so long been shown by simple men dying.” His lamentation is augmented by another view illuminated by Kübler-Ross in her research in 1969 on the stages of dying and her book, *On Death and Dying*.

Elisabeth Kübler-Ross expounded on what the dying have to teach doctors, nurses, clergy, and their own family. She identified five stages of dying: denial, anger, bargaining, depression, and acceptance and advocated for healing professionals to recognize them. She argued that we are fearful of an imagined agony at death. We demand that medical professionals delay dying as long as possible and believe that death signifies defeat of the physician. The sustaining virtue for the patient to reach the final stage is identified as hope, likened to a metaphorical thread running through the five beads of the stages of dying. Ironically, Kübler-Ross blames fearful death on recent advances of medical technology—the source of the blessing of longer life. Along with books such as Callahan and Kelley’s *Final Gifts*, Kübler-Ross’s *On Death and Dying* has been instrumental in improving the American hospice system.

As seen by the four principles of bioethics studied by Beauchamp and Childress, American bioethics for end-of-life care proclaims and upholds the rights and autonomy of the dying to make decisions. As shown in legal cases such as *Bouvier v Superior Court* (1986) and *Cruzan v Director, Missouri Department of Health* (1990), justice and beneficence are pushed behind. The right to die was legally recognized in these cases, and after some European countries made some similar legal judgments, the *Death with Dignity* law (ORS 127.800-995) was passed in Oregon in 1994.

The main reason Oregonians resort to physician-assisted suicide was to ensure that the dying person would not lose control of his/her own dying process. Evidently, the fear of death would be “overcome and controlled” by the option of suicide. We modern Americans have been offered a way out of the sanitized and grim Western death experience through Kübler-Ross’s hospice care and Gilbert’s remedy of poetic imagination. Is there another healthy way to approach dying, another modern *ars moriendi*, investigated “out of the box” of our Western thoughts?
East Asian Attitudes toward Death

Chinese philosophy is likened to a concerto with three movements. The first movement is the ancient wisdom systemized by Confucius (551-479 BC), who had collected and promulgated wisdom to bring social order in Spring Autumn warring period. The second movement can be described as the medieval period, which predominated during the first millennium, while Taoism and Buddhism were adjusted to and adopted as the “Three Teachings of China.” The last movement, lasting for the next millennium, began with Confucian logical systemization by Chu Hsi (1130-1200 AD) and continued with Neo-Confucianism, which is hallmarked by a revival led by Wang Yang-Ming (1472-1529 AD). Presently, we observe a recent new renaissance to rejuvenate Confucian creative self-transformation proposed by Tu Wei-Ming.

The main thematic assertion throughout the three movements is that man can self-transform creatively to become a superior man (君子) and a sage, while he abides perseveringly in two prime virtues; 仁 (humaneness,仁) and 禮 (ritual,禮) with 真 (sincerity,誠). I draw from A Source Book in Chinese Philosophy by Wing-Tsit Chan to survey Chinese philosophy with Chinese characters so that those familiar with them will have a greater understanding of the subtleties.

Confucius (551-479 BC) was able to elaborate the possibility of human perfectibility and an idea of subjective anthropocentrism. For the next 2500 years, his teaching of 仁 (仁) and 禮 (禮) and his philosophy have spread widely to influence profoundly China, Korea, Japan, and Vietnam. Mencius (371-289 BC), an idealistic Confucian sage, refined and internalized Confucian teachings by emphasizing the inner ability of the mind to do good by cultivating the original seeds of the beginnings of four virtues: humaneness (仁), righteousness (義), propriety (禮) and wisdom (知). Presented here are the teachings of both Confucius and Mencius relevant from the Chinese classics, Analects, Mencius, The Great Learning and the Doctrine of the Mean.

a) The Mandate of Heaven (天命): Heaven is the first component of the Chinese “trinity” which is followed by the two other components, Earth and Man. Whereas the concept of earth consisted of natural phenomena such as the four seasons and wind and rain, the idea of Heaven was transformed from the idea of the omnipotent devilish spirits with angry demands in prehistoric China (up to 800 BC) to the concept of the benign ancestral supporters. By the time of the Spring and Autumn era (500 BC), the importance of the brutal powerful mandate became minimized, as the Confucian humaneness of virtue was considered more important. Heaven’s will became a moral destiny and natural endowment in about 1100 AD, when Chu Hsi—the Chinese Thomas Aquinas—systematized the Confucian philosophy with Taoism and Buddhism. When Confucius was very ill in his old age and a prayer was offered by a student, he responded that “What counts is the life that one leads.” Human beings are self-perfectible as long as they are trying sincerely to be god-like. This unceasing effort of man is limited and only perfectible through hope. Confucius taught a concept of fate and destiny, in which one is to be neither in despair, nor to be presumptive about death and life.

b) Confucian idea of fate and destiny: Wing-Tsit Chan upholds the Confucian theory of “waiting for destiny” as the best prevailing theory over other theories about destiny or the mandate of Heaven. According to this theory, man should exert his utmost in moral endeavor and leave whatever is beyond our control to fate. Life and death are the decree of Heaven. The superior man does not complain against Heaven above or blame man below.’ Confucius knew the Mandate of Heaven at the age of 50. Still he strived to be at ease with whatever he heard and could follow his heart’s desire without transgressing moral principles.

c) Funeral Reaction by lamentation, emotional crying, singing, and beating on an earthen bowl: The aforementioned Confucius’ lamentation to Heaven is contrasted with Chuang Tzu’s (莊子) singing at the death of his wife. Univocal logic is only good in mathematical problem-solving. The mystical way of Chuang Tzu (399-295 BC, Taoist philosopher) who has expanded Lao Tzu’s Taoism, needed a dialectical poetic voice to make a sense of the absurdity of dying (Chuang Tzu, the equality of life and death). In response to remonstrations for his mourning, Chuang Tzu said, “…I realized that originally she had no life; and not only no life, she had no form; not only no form, she had no material force. … for me to go about weeping and wailing would be to show my ignorance of destiny.”

Chinese culture recognizes Heaven, fate, and spirit, but anchors the existential perspective on family life; whereas Western culture looks to God for individual salvation. Ariès reviewed how Christians relied on the concept of afterlife to cope with the despairing agony of the deathbed. For the modern, Gilbert invoked “an imagined resurrection
COMMENTARY

East Asian Attitudes toward Death—A Search for the Ways to Help East Asian Elderly Dying in Contemporary America

in order to embrace the mystery of death.”

This fundamental difference in perception of existence as deeply embedded in family as opposed to individualist existence is extremely important for understanding the way that East Asian people cope with grief in death and dying.

d) Five Relations of Mencius:

Mencius advocates that the seed-like goodness inborn in man’s heart can be cultivated to bear good fruits by persevering education. “Man without education becomes none but an animal.”

The Five Relations teach that there should be a norm of human relations by moral reciprocity with a hierarchical degree of priority; “… between father and son, there should be affection (父子有親); between ruler and minister, there should be righteousness (君臣有義); between husband and wife, there should be attention to their separate functions (夫婦有別); between old and young, there should be a proper order (長幼有序); and between friends, there should be faithfulness (朋友有信).”

Chan points out that only the first relation is biological and the rest are moral relationships. It is of note that this precept of Five Relations does not include strangers and the enemy. Out of the five, the affection between father and son trumps over the righteousness in social relationship. When a father has stolen a sheep, his son should conceal the misconduct of his father rather than bear witness against his father. Even a son-king should resign his kingship, when he discovered his father-king’s past misconduct, he should run away with him and hide together far away, Confucius admonishes. The reason, he explains, is that the father-son affection should be protected at all cost. This prime utmost value of the family is crowned in East Asian ethics as the doctrine of relational autonomy of the East against that of individual autonomy and freedom of the West.

e) Eight steps of creative self-transformation of The Great Learning (大學): The Great Learning (大學), a small one-chapter classic, has exerted great influence on Chinese thought. This is a Chinese methodology to learn to be a superior man, to cultivate an affectionate family, and to promote peace in the world. These eight steps, which include the investigation of things (格物), extension of knowledge (致知), sincerity of will (誠意), rectification of the name (正名), cultivation of personal life (修身), regulation of the family (齊家), national order (治國), and world peace (平天下), start an individual creative self-transformation by inner investigation and sincere contemplation. He then transforms the family, his society, and the world. Once skilled with this method, a student of ethics could take a journey through the Chinese dialectics of harmonization to reconcile with the fear of death.

f) Chinese dialectics of harmonization and New Confucianism of Tu Wei-Ming: To overcome the impasse of Western dialectics of contrast, Chinese wisdom offers the harmonious dialectics before known as “following two courses at the same time,” which is found in a story of a monkey keeper’s ingenious reconciliation with his grumpy monkeys by simply switching the feeding sequences from three-nuts-in-the-morning-four-in-the-evening to four-nuts-morning-three-evening.” Therefore, when the sage harmonizes, the right and wrong rests in natural equalization. Chinese Doctrine of the Mean emphasizes a dynamic center embracing the opposites together on the middle in the ever-changing process without forgetting the ideas of two opposites. Tu Wei-Ming’s creative self-transformation takes its root from Confucius’ admonition to be a man of dialectical harmony: “… A man of humanity, wishing to establish his own character, also establishes the character of others, and wishing to be prominent himself, also helps others to be prominent.”

Tu claims that persevering self-improvement could be possible only by helping others improve in the hope that we together will eventually be in peace.

What are the Pertinent Aspects of Confucian Ethics to Help Us Care for Elderly East Asians, Sick and Ill in the US?

Three concepts of East Asian ethics, once appropriately applied to the principles of American bioethics, will benefit East Asian elderly for a better process of dying.

The Relational Autonomy of Family; An Aspect of Interpersonal Relation

In contrast to the political personhood of the West, in which a Westerner considers family as a volitional option, the familial personhood of the East stands on the foundation of a family with each individual person. “Filial piety (孝) is one of the roots of humanity, with the other brotherly love …” The continuity of a family connotes perpetuity of the self and is valued as a way to accomplish personal immortality in the Chinese mind. Having no children was one of the three vices against his parents according to Mencius.” A son should respect and care for his aging parents and keep ritual sacrifices after their deaths. The individual and his or her fam-
ily are closely bonded, rather than two separate entities. In contrast, the generational union of Western families is melting down, perhaps, because the individual right Trumps over the familial right. According to H Tristram Engelhardt, Jr,14 Western marriage is a love-initiated, partially economic symbiotic arrangement for bicareer cohabitation. Atomized Western man is dislocated historically: once he goes off to college declaring an independent life, he is a nuclear man without family. Individual rights and freedom, as guaranteed by the US Constitution, trump those of the family. Subsequently, the euphoric freedom of the individual eventually becomes boredom. A life without purpose becomes meaningless. I lament that this is one of the untoward side effects of Kantian autonomy and Nietzschean nihilism.

To rescue The Western Fall of Man, Shui Cheun Lee,15 an East Asian ethicist, proposes a concept of relational autonomy that entails a two-dimensional decision-making process for end-of-life care. Western individualism is rejected, because it insists on, “I am, therefore you are.” Instead, “You are, therefore I am” is the core of Confucian ethics. In the Doctrine of Mean and the dialectics of harmonization, patient and physician invite the family as a three-member group for the purpose of agreeing on important clinical matters. When an Eastern man becomes sick, all family members are afflicted because life’s value is family-centered in spiritual, ethical, and financial matters. A human being is a being-in-between, as promulgated by The Five Relations.7 For Eastern culture, discussion of diagnosis and prognosis are often not confidential matters between the patient and physician.

Confucian Creative Self-Transformation Toward Sagehood; An Aspect of Personal Self-Perfecibility by Helping Others be Perfect

According to Confucius, the Chinese concept of immortality becomes possible and conceivable through virtue-building, achievement, and perseverance.7 Anyone is perfectible by the eight steps of The Great Learning. The six stages of Confucius’ life have been drawn to undergird the self-transformation of Tu Wei-Ming’s creative improvement of character in New Confucianism. The creative tension built by internal ren (humanism, 仁) and external li (propriety, 礼) has been a dynamic force for a persevering person to take a journey as a pilgrim of hope toward a process of becoming an authentic human being, which is the Confucian Heaven. In a similar vein, a pilgrim with family undergoes a reciprocal change with cultivation and transformation, as together they accomplish sagehood. In essence, the pilgrim and society become one, neither alone nor separated. Tu’s two dialectical transformations are reminiscent of the double movements, the infinite resignation and the leap of faith, of Kierkegaard.16 Then, when an East Asian old man in the utmost interest of sagehood follows the path of Confucian perfectibility of personhood, he would be able to embrace his death and dying with no fear or boredom, but rather with joy and pleasant surprise. By his age of 70 years, Confucius could follow his heart’s desire without transgressing the moral principles7 and Chuang Tzu was able to sing at his wife’s funeral.

The Unity of Transcendence and Human Being: An Aspect of Confucian Religiosity

Confucius said, “How abundant is the display of power of spiritual beings!” However, Confucianism has not been recognized as a religion in the West, because it has no doctrine of a deity and is not affiliated with an institution. Those western thinkers often quote, to disparage the lack of religiosity in Confucianism, Confucian retorting, How can we know about death, if we don’t know yet about life.7 But Tu asserts that Confucianism is religious because it has faith in the ultimate goodness and all-embracing divinity of human nature, decreed by Heaven to be fully realized through the conscious and conscientious activity of the mind.8 Tu restates Confucian religiosity in terms of a twofold process: a continuous deepening of one’s subjectivity and an uninterrupted broadening of one’s sensitivity.8 The concept of Heaven has been transformed for two millennia from devilish and wild spirits to guiding norms of morality and principles of nature, as illuminated in the earlier section (a). In addition, atheistic Chinese religiosity became tamed and philosophized by Neo-Confucian thinkers, accommodating Taoist’s mysterious Tao and Buddhism’s metaphysics. East Asian people believe that through family names and rituals they are able to keep their spirits alive symbolically. Therefore, a person is never forgotten nor dies. In contrast, Western Christianity rejects death, believing in eternal life after death. Eastern philosophy is narrative, Western is analytical. The characteristics of the former are intuitive, practical to know bow, interdependent, and corelational, whereas the latter is logical, systemic to know what and independent. The Eastern process is of dialectics of harmonization and cyclical in the worldview, as
the Western process is of dialectics of conflict and evolutionary and linear in the worldview, according to Ames.17

Conclusion

There are three aspects of East Asian ethics to help the elderly from East Asia embrace their death in better moral comfort: the relational autonomy of family, new Confucian creative self-transformation to sagehood, and Confucian ethicoreligiosity. How can Western clinicians help dying patients of East Asian culture? First, encourage, invite, and involve the patient’s family in the conversation about end-of-life care. Because they find the meaning of life grounded on the relational autonomy of family, East Asian elderly patients tend to be less individualistic and hope to be a part of the family. Second, East Asian cultures value a specific kind of self-improvement, which becomes perfectible with others. Asian-American patients may appear to be stoic, self-controlled, and meditative in facing pain and death; they accept Heaven’s mandate as a part of natural passage. These attitudes may come from supranaturalistic Taoism or Zen Buddhism. A physician finds that the patient ends his/her life in peace as a cycle of nature. Furthermore, by helping others improve they become self-transformed. Together, they will eventually be whole and in peace. Such community solidarity undergirds the relational autonomy of family. Finally, East Asian atheistic ways should be recognized to be as religious as Western theism. East Asians believe in the benevolent spirits of ancestors, whom the living ought to keep pleased in annual rituals. Such religious thoughts provide hopeful answers to the mystery of death for the dying. Physicians could draw Confucian religious resources for East Asian elderly to ease the existential suffering of death.

The difference in the roots of these two traditions should be recognized in each unique locality if we hope to maintain peace in local and global communities. Engelhardt14 proposed to recognize moral strangeness in our global village, where the moral diversity is one of the features of the global world. By drawing wisdom from Confucian relational autonomy of family, dialectics of harmonization, and the creative self-transformation toward a peace under the religious Heaven, we could explore a new ethical theory to facilitate globalization without losing particularity.

Acknowledgements

The author expresses thanks to Professor Robin Wang for her guidance in his independent study of Chinese Ethics in 2008 and to Professor James Walter for reading this manuscript and for his encouragement. They both teach at Loyola Marymount University in Los Angeles, CA.

Reference

Chronic Disease and The World Health Organization

It is estimated that 35,000,000 people died from chronic diseases around the world in 2008. Every year, more than 60% of all deaths worldwide are from chronic disease. The World Health Organization (WHO) reports that for the first time in history deaths from chronic diseases will soon exceed deaths from communicable diseases, maternal and perinatal conditions, and nutritional deficiencies combined in low-income countries.1

According to WHO, comprehensive and integrated action is the means to prevent and control chronic disease.2 In developing countries, such as Ethiopia, chronic disease is a growing problem. Like many other chronic diseases, the incidence of chronic kidney disease (CKD) in Ethiopia is rising because of increased risk factors such as high blood pressure and diabetes mellitus.3 Despite the high prevalence of HIV in Africa (25% in some antenatal clinics), HIV nephropathy incidence is fairly low. In Africa, End Stage Renal Disease (ESRD) remains a mostly fatal disease.4 Treatment considered the norm in industrialized countries is limited in Africa: dialysis is dependent on the availability of funding and charitable contributions.5,6 Few governments cover the cost of renal replacement therapy. For a variety of reasons, primarily financial, medical care in third world countries is inadequate at best, especially for expensive chronic illness treatment therapies such as dialysis and transplantation.5,6

Getting Involved

Because of my involvement in nonprofit work for the poor with kidney disease, I was approached, in 2007, by the family of Yeneneh Betru, MD, to help them set up a dialysis center in Ethiopia. Dr Betru grew up in Ethiopia and received his education in the US. He trained as a hospitalist and worked at St Joseph’s Hospital in Burbank, CA. After becoming a physician, Dr Betru returned to Ethiopia to care for his dying grandmother. Despite his knowledge of western medicine, he was unable to help her and she died. Concerned because the hospital where his grandmother spent her final days lacked specialty care, he asked Ethiopian physicians what could be done to improve the care of patients in Ethiopia. The response was “we need dialysis machines.”

Upon returning to the US, Dr Betru enlisted his family to start a foundation focused on providing dialysis services to the poor in Ethiopia. On September 11, 2001, Dr Betru was killed when the airplane he was on crashed into the Pentagon. Since then the Betru family has been trying to open a dialysis unit for the poor in Ethiopia. Through donations, they were able to purchase several dialysis machines and to ship them to Ethiopia; however, without an accepting physician, the machines were quarantined in the Ministry of Health where they remain—of use to no one.

My work with the Foundation to Improve Renal Nutrition in the Antelope Valley (www.firnav.org) brought the Betru family to me seeking help in forming a nonprofit organization to provide dialysis services to people in Ethiopia who could not afford them. The Dr Yeneneh Betru Foundation (www.yenbfoundation.org) was founded and began searching for a hospital to sponsor the program and to fulfill the dream of Dr Betru. On September 11, 2008, along with other members of the Dr Yeneneh Betru Foundation, I visited Bethel Hospital in Addis Ababa, Ethiopia to dedicate a dialysis center to serve the poor with kidney disease.

People with ESRD require Renal Replacement Therapy (RRT)—dialysis or kidney transplantation—to maintain life. The treatment of ESRD is expensive and not covered by the national health care program in Ethiopia. The Dr Yeneneh Betru Foundation believes that if we can develop a model of care to help the poor in Ethiopia, the lessons learned could be used to help the poor in other low-income countries.
Ethiopia

Approximately 82 million people live in Ethiopia, a population greater than Canada, Portugal, Australia, and Greece combined. The life expectancy in Ethiopia is estimated at 53 years for men and 57 years for women. About 40% of the population lives in abject poverty. The annual gross domestic product is only about $56 billion and the gross domestic product per capita is about $700. Anecdotally, I was told that a nurse working in a community hospital earns about $1200 per year and the average salary for a physician in the same hospital is about $24,000 per year.

The health status of the Ethiopian is extremely poor. Ethiopia’s main health problems are communicable diseases caused by poor sanitation and malnutrition. These problems are exacerbated by the shortage of trained nurses and clinicians and of health facilities. In 2000, there were 103 hospitals and 338 medical centers in Ethiopia. There are only two medical schools in Ethiopia and Ethiopians share fewer than three physicians per 100,000 people. Poland has 200 dialysis centers; Spain has 400. By comparison, Ethiopia has a population twice that of Poland and Spain combined has only two dialysis centers and two nephrologists. The country is challenged by emigration with many educated professionals leaving Ethiopia for a better economic opportunity in the West.

Renal Replacement Therapy in Ethiopia

There are virtually no published reports on the incidence, prevalence, or survival of patients with kidney disease in Ethiopia. In most sub-Saharan African countries, the majority of patients with kidney disease die because of lack of treatment. While in Ethiopia, I observed that there were only about 20 functioning dialysis machines treating fewer than 100 chronic dialysis patients.

Dialysis services in Ethiopia are limited because of cost and availability. During my trip I found that at Bethel Hospital, the cost of a dialysis treatment is about $100 US. Because most of the people on dialysis are poor, this is a prohibitive cost. While rounding at the dialysis center, I saw many patients who only come to the dialysis center once a week because that is all their families can afford. Routine laboratory tests are not performed. Most patients have a noncuffed catheter because hospitals do not have access to cuffed catheters. Most catheters are placed in the subclavian vein—with a high risk of stenosis—and do not have sutures at the exit site. Artery-to-vein fistulas used for dialysis access are extremely rare (less than 10%).

On dialysis rounds, I discovered that an internist with no training in dialysis wrote most of the dialysis orders. Most patients had a standard order for dialysis with minimal changes in the script based on the patient’s current health care status. On dialysis rounds I saw that most patients did not have recorded pre- and/or postdialysis weights. Some patients were chronically fluid overloaded and others were chronically fluid depleted. For example, one patient was significantly fluid overloaded (from deficient ultrafiltration) with uncontrolled hypertension; after increasing fluid removal during dialysis her blood pressure returned to normal. Another patient complained of severe cramps (from excess ultrafiltration) one hour into dialysis each time he was treated. Because his treatment was so painful, he avoided treatment more than once a week. His symptoms were resolved with two liters of normal saline.

Exacerbating the issues of cost and lack of availability is the lack of education. There are no renal dietitians or renal social workers in Ethiopia. For most chronic disease, this has a profound effect. One example of the hazards of poor education is mango juice. At the clinic, I found two patients with mango juice at their bedside. Mango juice is a common drink in Ethiopia: it is purchased in the concentrated form and diluted to taste. Mango juice is very high in potassium (1/2 cup contains 323 mg of potassium) and could be lethal to a patient with ESRD whose daily potassium intake is not to exceed 2000 mg. ESRD prevention and pre-ESRD care are essentially not existent. I met an endocrinologist who cares for patients with CKD and diabetes who noticed an increase in incidence of CKD over the last year mainly from type 2 diabetes associated with obesity. Because there is no treatment...
for ESRD in Ethiopia, patients are unwilling to get screened for this fatal disease. Most patients admitted to the hospital that I saw on rounds had blood urea nitrogen levels >300 mg/dL (normal value 7-21 mg/dL). Blood hemoglobin levels were also very low, averaging <6 gm/dL (normal values 12-18 gm/dL). For financial reasons, erythropoietin used to treat anemia in ESRD is not available. Blood transfusion to treat anemia requires a family member to donate a unit of blood before a family-member patient can receive a unit of blood. No donation, no transfusion.

**How to Improve Access for Renal Replacement Therapy in Ethiopia?**

I believe that developed countries and clinicians from around the world should unite to develop a “Health Corp,” similar to the Peace Corp, to provide in-kind support (supplies, medications), volunteer time, and intellectual assets (free Web site tools, access to recent publications in kidney disease management, etc) to help overcome the health care deficits in low-income countries like Ethiopia. Medical universities could require students, residents, and fellows to spend at least one month of their training in low-income countries. This would have an immediate effect on the ability to provide preventive services to Ethiopians while expanding the knowledge base of students before they go into general practice.

To address the CKD problem of Ethiopia sustained efforts from nongovernmental organizations (NGOs), governmental agencies, the pharmaceutical industry, and medical training programs are needed. The goal is to prevent renal failure and death from renal failure. To achieve this goal, development of a high-quality chronic dialysis program is needed. In countries like Ethiopia, most patients will not have access to therapy for kidney failure. With limited resources, the focus must be on detection and prevention of kidney disease. However, as part of this effort it is important to lay the foundation for effective care programs to treat advance stages of kidney disease, including treating kidney failure with dialysis. Patients with ESRD must receive dialysis services to maximize the number of patients who will benefit from this lifesaving procedure and clinicians must have the tools to effectively treat renal failure. By providing ESRD services it is also hoped that more people will be screened for kidney disease because treatment for disease would then be available.

In most low-income countries, health care spending is supplemented by user fees and supplemental aid from outside the country. Because Ethiopia is several decades away from becoming a middle-income country with a national health care program, funding for prevention and treatment must come from private and NGO sources, such as in-kind donations and volunteer programs. A mixed model of care may be a way to subsidize health care services for the poor. Malaysia provides its dialysis services via a blend of model of care of public hospitals, for-profit private centers, and not-for-profit organizations, such as religious groups, the National Kidney Foundation and the Rotary club.

**Conclusion**

Medical leaders from around the world are aware of the potential kidney disease burden in Africa. In an attempt to make a significant impact on the future burden of kidney disease, medical leaders should try to work with local policy makers, business leaders, pharmaceutical companies, and clinicians to develop population care management programs that focus on education, early detection and effective treatment to prevent and to slow down progression of kidney disease.

In summary, to help reduce the current and future burden of kidney failure in Ethiopia, there must be:

- a continual supply of volunteers to reduce the cost of care and to provide current information on evidence-based guidelines and professional standards
- a continual supply of in-kind donations to reduce the cost of care from consumables

Dr Yeneneh Betru Foundation Advisory Board Members (left to right): Steven Warshawsky, Dr Susanne Nicholas, Dr Philip Tuso, Maureen Woodson, Mary Mosser, Ruth Betru, Sirak Betru.
cooperation with pharmaceutical companies to provide generic medications to help treat anemia, diabetes mellitus, high blood pressure, vitamin deficiencies, and bone disease.

The burden of kidney failure in Ethiopia is concealed behind statistics that reflect only the number of people treated, not the number who die of kidney failure. Clinicians must focus on the early detection, prevention, and management of kidney disease. There should be registries to determine the true prevalence of kidney disease in Ethiopia. Dialysis services will need to be affordable and very cost-effective by using in-kind donations, government cooperation, and volunteerism.

However, to make a real difference in the lives of Ethiopians who have kidney disease, physicians and leaders from industrialized countries must be proactive. Globalization will result in an increase in the number of people in low-income countries with diseases that cause kidney disease. Low-income countries will not be able to develop the medical infrastructure to handle the newly discovered disease burden. To bridge the gap in needed health care services, the Health Corps program I have proposed will need volunteers and in-kind donations from high-income countries. It must be an organized effort that will be a clearing house and recruitment tool for volunteers and donations to drastically change the delivery of needed services to patients in third world countries. For more information about how you can help treat kidney disease in Ethiopia, e-mail me at phillip.j.tuso@kp.org.

Disclosure Statement

The author has no conflicts of interest to disclose.

References


A Good Thing

Can we ever do too much of a good thing?

— Miguel de Cervantes, 1547 – 1616, Spanish novelist, poet, and playwright
The World Health Organization’s Evidenced-Based Approach to Chronic Diseases: Primary Prevention or Caring for End-Stage Disease?

Tom Judd, MS, PE, CCE, CPHQ, FACCE

Introduction

Phillip Tuso, MD’s, commentary (page 61) excellently describes the difficult challenge of caring for people in Ethiopia with chronic kidney disease. Dr Tuso raises a very important question: How much should a developing country invest in caring for the end-stage disease state versus extensive revamping of primary care to enhance preventive interventions? On the basis of 20 years of experience as a World Health Organization (WHO) consultant, I would like to discuss how WHO addresses this important question.

World Health Organization’s Approach—Comprehensive and Balanced Recommendations

Dr Tuso appropriately points out that, according to WHO, comprehensive and integrated action is the means to prevent and control chronic disease.1 Dr Tuso also notes that, regardless of the economic limitations in low- and middle-income countries, ongoing dialysis or kidney transplantation is mandatory for the survival of patients with end-stage kidney disease. He also cites the White et al recommendation to develop locally appropriate transplant programs, effective use of nongovernmental sources of funding, service planning, cost containment, use of generic drugs, and local manufacture of dialysis consumables. Also some low- and middle-income countries must rely on education, the development of good public policy, and a supportive international environment. “Prevention of end-stage kidney disease, ideally as part of an integrated approach to chronic vascular diseases, must also be a key objective.”2

These kinds of comprehensive and balanced recommendations by WHO also extend to other chronic diseases such as hypertension3 and diabetes4 and are consistent with my experiences as a WHO consultant. I have had the privilege of participating in several WHO evidence-based medicine (EBM) initiatives in developing countries, primarily helping Ministries of Health (MOH) in Asia, Africa, Europe, and Latin America implement improved health resource planning and management.

World Health Organization—Integrated Healthcare Technology Package

Today, as a United Nations organization, WHO is strategically driven by the 2015 Millennium Development Goals (MDG).5 For example, the MDG to “scale up HIV/AIDS treatment” requires sustained country support for expanded training, and helping to strengthen physical resources such as laboratories and testing equipment. However, linking the reality “in the field” with these priorities is a huge challenge in WHO’s 193 member states.6

Regarding proper health resource management driving balanced interventions, the WHO perspective is that “the proper match between the supply of inputs and health system requirements, the balance between capital investments and recurrent costs, and the system’s capacity to manage purchased inputs throughout their entire life cycle are vital for the effective delivery of health services and satisfactory performance of the health system.”7 WHO’s Integrated Healthcare Technology Package (IHTP) is a planning methodology and software-based tool that provides guidance on an adequate mix of resource inputs, including human resources, medical devices, pharmaceuticals and facilities, needed to deliver a defined set of health interventions. IHTP integrates in one single tool the health care needs, disease profiles, patient demographics, clinical practice guidelines (CPGs), resources, availability, costs, constraints, and management capacity. The focus throughout is on prevention and caring for the chronic diseases.

Tom Judd, MS, PE, CCE, CPHQ, FACCE, is the National Project Director for Kaiser Permanente Clinical Technology. He has been a consultant to the World Health Organization for 20 years, focusing on assisting Ministries of Health with the Integrated Healthcare Technology Package implementations and other technology management challenges in Kyrgyzstan, Kosovo, Kenya, Mexico, and other countries in those regions. E-mail: tom.judd@kp.org.
Clinical Practice Guidelines—Helping Countries Understand Resource Needs

Several hundred evidence-based national and global CPGs have been mapped in IHTP the past ten years, allowing simulation and analysis of the health services' resource requirements of various countries. Clinical interventions addressed in a dozen pilot countries thus far include WHO programs for maternal and child health and adult chronic diseases, and various surgeries and priority communicable diseases.

Examples of CPGs mapped in IHTP for WHO’s Integrated Management of Childhood Illnesses (IMCI) program at primary and secondary levels of care include: pneumonia, cold, bronchiolitis, croup, diphtheria, pertussis, tuberculosis, diarrhea, dehydration, dysentery, malnutrition, typhoid fever, meningitis, measles, malaria, dengue fever, otitis media, urinary tract infections, heart failure, hyperthermia, HIV/AIDS in children, pneumocystosis, burns, fractures, and head injuries.

This approach also reflects a balance between primary prevention interventions (eg, as demonstrated for hypertension and diabetes) as well as investing in ongoing EBM treatment.

Here are two examples from my colleagues and my own experience with WHO IHTP initiatives in these countries:

Kyrgyzstan (Central Asia):

The initial MOH focus was optimal resource management and care for hypertension in adults, anemia in pregnancy, tuberculosis, acute respiratory illnesses in children, and brucellosis. Later, over 120 CPGs were developed by clinical experts and approved by the MOH at three levels of care. They were then mapped in IHTP, validated, and implemented leading to increased CPG compliance by practitioners.

The following improvements were noted:

Resource Planning and Management

• Typically “siloed” planning was integrated and databases standardized for the following, resulting in:
  
  Human Resources
  – More family practice staff were identified and trained
  – Standards set and physician/nurse responsibilities clarified

  Pharmaceuticals
  – VAT fees for externally purchased drugs were removed
  – MOH rules were developed allowing medical drugs sold at sites where local pharmacies are not available
  – Handling of donated drugs was improved

Facilities

• Coordination with local governments was improved assuring funding for primary and secondary facility renovations

Medical Equipment

• National MOH policy was implemented for rational use of medical devices
• National MOH policy was implemented for purchase of high technology, high cost devices

EBM “ideal” CPGs comparison with current country-level “actual” CPGs using IHTP

• Ideal six CPGs: provided by the Finnish Lung Health Program for Adults
• Actual six CPGs: Acute Bronchitis, Bronchial Asthma, TB, COPD, Pneumonia, and Acute Respiratory Viral Infection were also mapped in IHTP for comparison

IHTP Gaps Analysis

• For five sites in urban and rural areas, at both primary and secondary levels of care
• Cost analysis compared for ideal versus actual CPGs
• Pre-post clinician training showed cost-effectiveness of EBM
• Clinicians began to reduce unnecessary tests, staff, and drugs
• Facilities began to ensure access to vital medical devices for testing results
• MOH began to use ideal CPG costs for Adult Lung Health for national reimbursement through the Kyrgyzstan Mandatory Health Insurance Fund.

Mexico

IHTP was formally introduced to MOH Mexico in 2005. The MOH department responsible for health technology planning and management activities (CENETEC, Mexico, DF, Mexico; www.cenetec.salud.gob.mx), agreed to direct these efforts. CENETEC formed a small team with a project manager and physician partner to pilot use of IHTP for perinatal care. CPGs (four prenatal visits) were evaluated in two Mexico City clinics as part of the Popular Insurance Catalog—90 different procedures—provided by MOH free of charge to Mexico’s significant percentage of poor people. This initial work demonstrated IHTP’s value in rapid prototyping and cost modeling based on using process maps of clinical procedures and resource databases.

In early 2007, the MOH, on behalf of President Calderon, began a national health initiative: Caravan, a traveling primary care outreach clinic allowing timely referrals to hospital care, was sent to several of Mexico’s...
remote rural areas. Fifty Caravans were sent throughout all states of Mexico that year, and over 400 in 2008. CENETEC using IHTP assisted the MOH planning department in the Caravan implementation, studying optimal ways to deliver care.

The Caravan project team included a project leader (engineer) and two physicians, assisted by the WHO consultant. The team worked with various national physician leaders, assisting with development of 20 evidence-based CPGs including diabetes screening, breast cancer screening, as well as normal care and typical complications in perinatal care (prenatal care, pre-eclampsia, eclampsia, hemorrhage, and newborn care).

Conclusions

In the difficult challenge of caring for people with chronic diseases such as chronic kidney disease, the most important question is how much should a country invest in caring for the end-stage disease state versus extensive revamping of primary care to enhance preventive interventions? Around the world, my experience is that WHO recommends and assists countries in addressing both imperatives. As you can tell from the work in the two countries I highlighted, the WHO approach is very broad and balanced. I hope you now have a glimpse of how the WHO addresses this very complicated challenge in developing countries.

Disclosure Statement

This commentary reflects the opinions and experience of the author, and does not officially represent WHO.

References


The Toll of Chronic Disease

Global deaths from chronic disease are expected to rise 17% worldwide over the next ten years.

“Six Tulips”  
8 ½ x 11
Chinese brush painting on acid-free watercolor paper

By C Shore

This painting was inspired by Ms Shore’s passion for tulips, her favorite flower. She loves the play between the positive and negative shapes in this piece. Chinese Brush painting is the artistic dance of the fingers and hands. Each stroke commands precise movement with a particular rhythm. Ms Shore studies techniques of painting, and drawing at the Los Angeles Academy of Figurative Art, at the University of California Los Angeles, at international workshops, and with Nan Rae Parker at her Pasadena Studio. Ms Shore is a Kaiser Permanente member. She has been an educator in the Los Angeles Unified School District, employing all forms of art within the classroom. She found that being bilingual and using art throughout the curriculum were successful tools to teach subject matter to limited English proficient students. Ms Shore continues to advance her education in art and language.

More of Ms Shore’s art may be seen on page 76 and on her Web site: www.fineartbycarolyn.com
Health care needs and deserves the perfect computer system. We should begin with that goal and build our national and collective system agenda and IT investment strategy with the creation of a perfect system as our clearly targeted end point.

What would a perfect system for health care look like? We need to be very clear from the beginning what our expectations for a perfect system are if we are going to invest billions of dollars in health care IT as part of the national economic recovery agenda. We should be very focused on building the essence of the right system. We don’t want to lay that track twice.

**All, All, and Then All**

The perfect system for care should have “all of the information about all of the patients all of the time.” Real time care data. Comprehensive care data. Data for everyone. All, all, and all.

That single very basic goal should define, direct, channel, guide, and inform our overall American health care system’s agenda.

It would be breathtakingly stupid to put health care data on the computer and end up with the same sets of isolated, inaccessible, noninteractive information silos we have now with paper medical records. We need all the information about each patient. We need that information all the time—whenever and wherever care is being delivered.

Caregivers should not have to guess about their patient’s prior diagnosis or treatments. Caregivers should not be ignorant of patient medications or relevant test results. Caregivers for each patient should know all of the medical information about each patient, and caregivers should have that information available in real time at the point of care. That should be our goal. We should settle for nothing less.

Medicine is an information dependent science that operates far too often with a highly dysfunctional information deficit. That is wrong. We need to do better.

**Information Security is Essential**

If we really want optimal care, we need optimal information. Information security needs to be an absolute expectation as part of the package. That almost goes without saying. But it needs to be said.

Personal care information needs to be personal. We need real time and complete information to provide care and to track care and to do world class research about care. We need that information to be appropriately confidential so that it is used exclusively to support health and care.

Anyone who violates patient confidentiality and violates that confidentiality for some form of monetary gain, personal coercion, or to damage the reputation or credibility of a patient should be treated and penalized as a criminal. We need strict standards on use of data and we need strict penalties for people who willfully misuse data.

**CQI is Needed—and CQI Needs Data**

We very much need data. Care coordination cannot happen without data. Continuous care improvement simply cannot happen without data. No industry has ever done continuous improvement without data. Optimal medical research cannot happen without data.

The really good news is that we are on the cusp of a golden age for medical research. Most medical research done in the world today involves very small numbers of patients. The research is done most often to justify the sale of a drug or a product. When the “justification” process that triggered the research has achieved its goal...
Commentary

The Perfect System

The Perfect System in America: All, All, and then All.

As noted earlier in this book, most of American health care is divided into separate, unlinked, unconnected pieces—indeed, independent business units that often compete with each other for patients and market share. Hospitals compete with other hospitals. Within a given hospital, there can be anywhere from a couple of separate physician practices to hundreds of separate physician practices. A given hospital might have several sets of sur-

Most of Health Care is Splintered

This is not a book about Kaiser Permanente. But to understand the nature of the multi-year Kaiser Permanente learning process about computer support for care, it's probably useful to get a quick sense of how Kaiser Permanente is structured and how Kaiser Permanente has begun to use computers. The current investment in computer support at Kaiser Permanente is slightly over $4 billion, so there has been a recent chance to do some serious learning.

American Health Care Needs a Culture of Continuous Learning

That kind of follow-up research should be standard for every aspect of health care. It cannot happen and will not happen until we have data and the data is available for research.

Remember the basic and fundamental goal we need for The Perfect System in America: All, All, and then All.

When all of the data is available for all of the patients, longitudinal tracking of the long-term impacts of a given drug or implant or surgical procedure will become the basic working knowledge base for care, rather than a rare event, done infrequently, shared inconsistently, and seldom replicated.

So why is the recommendation for The Perfect System the goal that caregivers should have all of the information about all of the patients all of the time and why have caregivers at Kaiser Permanente adopted that basic data availability standard as a goal? It's helpful to understand that Kaiser Permanente has gone through a relatively useful learning curve over the past couple of years about the use of computer systems to improve care. This is probably a good time to share some of that learning.

Most of Health Care is Splintered

This is not a book about Kaiser Permanente. But to understand the nature of the multi-year Kaiser Permanente learning process about computer support for care, it's probably useful to get a quick sense of how Kaiser Permanente is structured and how Kaiser Permanente has begun to use computers. The current investment in computer support at Kaiser Permanente is slightly over $4 billion, so there has been a recent chance to do some serious learning.

As noted earlier in this book, most of American health care is divided into separate, unlinked, unconnected pieces—indeed, independent business units that often compete with each other for patients and market share. Hospitals compete with other hospitals. Within a given hospital, there can be anywhere from a couple of separate physician practices to hundreds of separate physician practices. A given hospital might have several sets of sur-

One of the key problems in health care is that it is fragmented and uncoordinated, with many different providers and organizations providing care to different patients. This can lead to inefficiencies and suboptimal care. The goal of The Perfect System is to create a single, unified system of care that provides all patients with all the information they need, all of the time.

The perfect system for care should have “all of the information about all of the patients all of the time.” … All, all, and all.

That's an embarrassingly inadequate situation. As we look at building the “perfect system” for health care, we should not accept that situation any longer. The health care community should know year by year the ongoing success rate or failure rate of each kind of implant and each kind of treatment for each kind of patient, and should be able to use that information to make future decisions about care—both for new patients and for the patients who already have the implant or the prescription or the type of care.

That level of specific treatment follow-up can be invaluable. A few recent successes in those areas give us a sense of what is possible. Kaiser Permanente has already used its own computerized database to track the long-term impact of people using VIOXX for pain relief and discovered serious downstream outcomes for a number of patients. VIOXX ultimately was removed from the market. Kaiser Permanente also used its current database to look at the longer-term outcome for patients with various types of heart stents. That research uncovered some concerns about patient outcomes over longer periods of time relative to some stents. The caregivers involved in that research ultimately recommended that patients with some stents be put on lifetime follow-up medication to reduce the risk of future heart damage. The manufacturers were not doing that research. Likewise, follow-up research into the Kaiser Permanente computerized registry of joint replacements showed major differences in the outcomes for different care approaches.

The Perfect System in America: All, All, and then All.
geons, several sets of oncologists, multiple independent internists, a raft of unlinked family practitioners, and a whole array of independent pediatricians, obstetricians, and various medical specialists and subspecialists. They usually all compete with each other for patients.

There are a lot of competitors in care delivery. Pharmacists compete with other pharmacists. Drug stores compete with drug stores. Labs compete with labs. And all that vast array of competing independent caregivers tends to get paid by another array of competing health plans, insurance companies, and various government program payers, like Medicare, Medicaid, the Veterans Administration, and some local welfare programs.

It’s an uneasy set of relationships most of the time. Most of the providers complain about most of the health plans relatively often, and most of the health plans have an arm’s length and sometimes problematic relationship with most of the caregivers. There are exceptions, but that is a fairly common set of realities.

The net result of that morass of competing and siloed business entities is that cooperation levels are often amazingly low. Getting each of the independent surgeons and surgical groups at a given hospital to simply agree on the best surgical tray to use for patients in that hospital can be an almost insurmountable task.

Agreeing on a common computer database is even more unlikely. Health care in America is splintered into an amazingly complex set of silos and pieces and separate, independent business units, and each business entity tends to have its own separate data filing system.

So how is Kaiser Permanente different from that normal care delivery context, and why does that difference cause Kaiser Permanente to think differently in some key ways about how computers can and should support care? Kaiser Permanente is a vertically integrated care system that has embedded—inside its own functional umbrella structure—all the key elements of care. Kaiser Permanente is basically a caregiver. Hospitals, clinics, pharmacies, laboratories, imaging centers, home health programs, health educators, and multiple other types of care are included inside Kaiser Permanente as part of a “vertically integrated” care model.

Kaiser Permanente serves about 8.5 million people with a staff of about 160,000 employees and nearly 600 care sites. The Permanente Medical Groups may be the largest private medical groups in the world. The Permanente physicians exclusively treat Kaiser Permanente patients. So Kaiser Permanente is basically a very “vertical” provider of care.

Kaiser Permanente also is a health plan. As a health plan, Kaiser Permanente enrolls the members who became the Kaiser Permanente care system patients. In its entirety, Kaiser Permanente is an almost self-contained blended model of financing and care delivery.

The total Kaiser Permanente organization serves a population bigger than 40 states and 140 countries, and currently has an annual revenue flow of $40 billion. The Kaiser Permanente infrastructure is big enough to create and sustain its own health care eco-system and data flow capabilities.

So Kaiser Permanente thinks a bit differently and more comprehensively and holistically about linkages, support systems, and shared data flow than most elements of US care delivery. Kaiser Permanente can and does think about computer systems and data flow from the perspective of comprehensive patient care, rather than the perspective of competitive patient care.

Kaiser Permanente set a goal several years ago to implement care-focused computer systems that would give all the doctors all the information about all the patients all the time. As noted above, Kaiser Permanente has invested roughly $4 billion to do that work and achieve that goal. The Kaiser Permanente HealthConnect electronic medical record (EMR) project is probably the biggest single private systems project ever done in any industry anywhere in the world. It has been successful, and every Kaiser Permanente Medical Group physician now exclusively uses the Kaiser Permanente HealthConnect medical record for his or her patient care. Every single Kaiser Permanente patient now has an electronic record instead of a paper record.


One-Third Reduction in Broken Bones
As a result of having that new database, Kaiser Permanente is engaged in a number of processes and programs to improve care. No one has ever had all that electronic information about patients before, so there is a major learning process underway. The Hawaii and Denver projects mentioned in Chapter 4 that made major improvements in care for chronic care patients in their geographic areas have been and are part of that overall learning process. A similar computer system–supported “Healthy Bones” program that was set up two years ago for all seniors in Southern California has managed to cut the number of hip fractures for those patients by 37%. The EMR was used to help the Southern California care teams focus on the needs of seniors at risk of bone damage. The whole effort was extremely successful. Healthy Bones programs are now rolling out to all Kaiser Permanente care sites.

If a similar Healthy Bones program could ultimately
be implemented for the entire country, that effort could reduce broken bones for all American patients by over 100,000 bones a year. That’s a lot of people who could be walking instead of limping, being pushed in a wheelchair, or functionally immobile.

Other care sites in America make more money when bones break, so those kinds of prevention programs don’t exist now in most care settings in America. So what do these successes tell us as a country in need of health reform? Because Kaiser Permanente is a total care system and basically plays every position on the health care field, Kaiser Permanente naturally thinks of systems from the perspective of the total patient, not just as a specialty-defined or care-site-defined piece of the patient. So Kaiser Permanente has had very good operational and functional reasons to figure out what an optimal data flow should look like for health care.

The question that was defined years ago by the medical brain trust at Kaiser Permanente was, “How can we use computer systems to help improve care?” The answer to that question was to build computer systems that are focused on patients, not on care sites or caregivers, and to create complete information connectivity, not electronic data silos.

“All, All and then All” was the first goal. The second goal created for the care support computer systems was equally clear: “Make the right thing easy to do.” Make the Right Thing Easy To Do

That may seem like more of a slogan than a strategic agenda, but when you begin to think systematically about care improvement, the importance of both elements of that goal become clear. We, as a national care infrastructure, need to figure out the “right thing” and then we need to “make it easy to do.” That goal is so simple it is profound. It’s a great guide for system design.

Why are those two goals and that learning relevant to the rest of American health care? Because computers are obviously and inevitably going to be used by all American caregivers—fairly soon. Decisions made now about system design, content, and desired use will affect how well that ultimate macro system of electronic data functions for all Americans in the future.

We, as a country, should not allow system development for health care to simply develop haphazardly or grow in silos. Thinking of computer support solely in the context of single care sites, single specialties, or single testing processes will never get us to optimal care results. We are starting in a deep hole as a country.

As noted repeatedly in this book, health care does not currently have a robust data support infrastructure in this country. That infrastructure will, however, be built in some form or another over the next few years because lots of people are now trying to computerize individual pieces of care. It would be very possible to build that ultimate infrastructure entirely wrong. It would have been incredibly stupid for Kaiser Permanente, for example, to build one computerized database for surgeons and another, unlinked and unrelated, computerized database for internists. Having stand-alone and unconnected data silos for allergists and neurologists would have been a very bad strategy for Kaiser Permanente to follow. Not having all pharmaceutical information available in each patient’s database would also have been both silly and dangerous.

The Patient Should be the Focus of Care Data

The key has to be to have the patient be the focus of the data pool—not the care provider—and to figure out the specific connectors needed to bring together all the care data for each patient who needs their care connected.

Connectors are critically important. As stated in Chapter 4, we can’t really cut kidney failures in half as a country unless the full team of doctors working with each high-risk kidney patient is working in sync to make care better for those patients.

Ten Criteria for Ultimate System Design

So in a nutshell, the Kaiser Permanente learning about data systemness (sic) is that the new American health care database should be:

1. Patient focused
2. Complete
3. Accessible by all relevant parties
4. Current (real time, if possible)
5. Easy to use
6. Linked to care improvement programs
7. Accessible to patients as well as caregivers
8. Transportable (when people change health plans or caregivers)
9. Interoperable
10. Confidential—with confidentiality enforced

How is that general strategy working so far for Kaiser Permanente patients?

Six Million E-Visits

It is a work in progress—and progress is being made. Kaiser Permanente patients now all have secure access
at home to their own medical records. Patients can also do e-scheduling, get lab results electronically, and have e-visits and hold secure messaging e-dialogues with their own Kaiser Permanente doctor. Last year, in California alone, Kaiser Permanente patients had over six million e-visits with their physicians. Most of those visits were in lieu of the patient having to drive to a clinic, check in, wait in a waiting room, wait in an exam room, talk to the doctor, get dressed, check out, and then drive back to work or home. Instead, six million times, the patient simply put the relevant question on the computer and pushed “send.”

Secure messaging and e-visits done by physicians with a high level of medical confidence are possible today because each Kaiser Permanente doctor receiving the electronic message from their patient can now instantly pop up that patient’s complete care data on their own screen to be fully informed about all the patient’s current care-related medical history before sending back a response.

That kind of connectivity and informed interaction between patients and caregivers is a path that will make sense ultimately for all of American health care. It won’t happen to any scale, in most settings, however, until physicians receiving the e-mail from their patients have convenient electronic access to that patient’s medical records or—minimally—to the patient’s electronic personal health records (PHRs).

Connecting data from multiple care sites and caregivers should be a top priority goal for the future of computerization in American health care.

**All New Systems Should be Connectable**

Any new hospital or private practice computer system implemented from this date forward should be set up to have the ability to connect data electronically with both payers and other caregivers. Both buyers and payers have the potential to play a major role fairly quickly in facilitating health care data connectivity. The current claims-based electronic care data sitting in the payer computers should be made available in a standardized format to both patients and caregivers. Both buyers and payers have the potential to play a major role fairly quickly in facilitating health care data connectivity. The current claims-based electronic care data sitting in the payer computers should be made available in a standardized format to both patients and caregivers. Right now—in a typical, American highly splintered care environment—a given patient might see six doctors and use two or more separate, unlinked hospitals. A recent Medicare analysis of patients with multiple comorbidities showed that the patients saw an average of more than a dozen doctors each in the prior two years. None of those care sites usually has any way of knowing about the actual care delivered at the other care sites. Most caregivers in America today have no transportable data except for pieces of paper. And that data is not connected with any other health care data in any useful way.

**The Perfect System is Possible**

So what should the perfect system look like? Complete connectivity should be the goal. Lab tests, electronic images, and diagnostic tool outputs should all flow electronically to the care site of the relevant doctor for each patient.

EMRs and labs should exchange data electronically, not using a data flow involving intermittent chunks of paper output that is subsequently re-entered—usually manually—into someone’s computer system to achieve electronic storage status.

Patients should ultimately have complete connectivity in their homes. Telemedicine is already a good tool for certain conditions. Electronic monitoring of high-need patients can be done from the home. Pilot programs in various sites are doing that now. Mechanisms that track blood sugar levels, weight, physical activity or inactivity, and even mental functioning can all be installed now in homes and linked electronically, in real time, to appropriate caregivers and care teams. Video medicine should definitely be part of the next round of care connectors.

Eliminating many doctors’ office visits should be a clearly defined goal of care support system design. Eliminating a major percentage of emergency room visits ought to be another system goal.

Cell phones can, should, and will become more versatile care connections both for the spoken word and for lab results and care instructions. The creativity levels will exceed anything we can think of now. One new system being piloted uses the cell phone to photograph every single food item that the patient eats each day and computes both likely calorie counts and the possible health impacts of the photographed food. The use of cell phones to transform pieces of care is going to quickly go past care delivery enhancements that we thought were possible just a few years ago.

People who advocate for The Medical Home should think of that concept from two perspectives: 1) creating a medical site that is the coordinating home for a given patient’s care, and 2) the actual home, itself, with each patient’s place of residence connected electronically in appropriate ways with each patient’s caregivers.

Ultimately, systems should become a fully embedded tool of caregivers and care. That process is just getting underway.
In the interim, some caregivers like Kaiser Permanente, The Mayo Clinic, HealthPartners, The Geisinger Clinics, and The Cleveland Clinic already have EMRs for their patients. Some are beginning to extend the linkages into the patient’s workplace and home. Patients at those multispecialty clinics can now get electronic access to their own medical information. In some settings e-visits, e-scheduling, e-consults, and e-supported behavior change models are all already in full operational status.

**Personal Health Records Can Fill Part of The Gap**

Patients who don’t have a full level of complete EMR-based data available from their caregiver should and could be able relatively soon to get an interim level of connectivity with fairly complete care data through payer-based standardized Internet-available PHRs from their health plans. As noted earlier, that claims database is now badly underused for care improvement and it can be the basis for computerized, Internet-accessible PHR functionality.

Buyers should demand that their payers produce at least PHRs for their employees. Most American health plans—if required to do so—can already produce some type of PHRs for their enrollees. Most patients with direct electronic access to their own computerized PHR report a high level of satisfaction with that access. The PHR can be a very useful care support tool and it should be both encouraged and required by all payers.

It should also be relatively easy to link data from the claims flow and the PHRs to appropriately designated registry databases for each patient, particularly if the payers require the PHRs be designed to achieve that goal. It will be fairly easy for well-motivated health plans to designate a service or a caregiver to monitor the care delivered in each registry, to be sure that appropriate care is being delivered for each patient.

The logistical challenge that needs to be solved in most settings will be to get the relevant data from the registry to each relevant doctor at the actual point, time, and site of care. Ideally, the various health plan system teams should set up a shared linkage into the registry databases so all providers can connect to the Internet and get linked to the care registries designated by the buyers for their patients. That level of single contact entry point is being piloted now by multiple health plans and care providers for real-time claims input and adjudication. A similar linkage is a very good idea for registry functionality.

**Hub-and-Spoke Connectivity Can Be Computer Supported**

Ultimately, electronic care connectivity could transform care in America and across the planet. Computer technology and connectivity can transform care everywhere. It’s not hard to imagine a fully computerized hub-and-spoke level of connectivity for third world countries (and even medically underserved rural America).
Virtual Care in Remote Sites

Telemedicine has a great future. It can bring high levels of expertise very efficiently and effectively to the exact sites where the care is needed.

Solid telemedicine linkages are not very far into our own future. Pilots are being done in various American sites now. In some cases, the care is being linked into people’s homes; in other cases, the information links go to remote American care sites staffed by front-level care support people. Those same kinds of tiered, computer-supported knowledge and care linkages may be the key to the only possible care design model that might work logistically for much of rural Africa, India, and China.

Next Step—Connectivity

Right now, in this country, we need to computerize care. We need to connect care. We need to connect caregivers.

We need data to track care outcomes and to continuously improve care. We need data for ongoing medical research. We need patients to know what works and we need caregivers to know what works.

We also need to make the right thing easy to do. It might be a good idea to take advantage of the learning cycle that Kaiser Permanente had been on relative to using computers to help support care and use the ten criteria for ultimate system design outlined earlier as a framework for making strategic decisions about IT investments for the country.

If we start with the premise that we need all the information about all the patients all the time, then we can develop various system elements in various places—and the linkages will be there. It’s a little like the Internet—creating a Web of interactive data flow—rather than silos of unconnected health care data locked into separate machines. We simply need better data about care and we need it whenever caregivers deliver care.

We spend $2.5 trillion on care in this country. We should keep track of the care we deliver and we should make our care better. To do that really well, we need everyone to have health coverage. We need everyone in the database. We need everyone in the database on The Perfect System.

Covering everyone is the right next step. Let’s look at why that is true.

References

“Le Café Jaune”  
18x24  
Oil on canvas  

By C Shore

This piece was inspired from images of a café in Monaco. Ms Shore was struck by the vibrancy of colors and the quaintness of the setting.

More of Ms Shore’s art may be seen on page 68 and on her Web site: www.fineartbycarolyn.com
Responding to the Language Challenge: Kaiser Permanente’s Approach

Abstract

Objective: To inform current debates on improving health care quality for patients with limited English proficiency by identifying the drivers and processes for one large health care delivery system’s implementation of particular models, key success factors, and remaining challenges for the field.

Study Design: A qualitative case study of the Kaiser Permanente (KP) San Francisco Medical Center’s approach to developing linguistic access services and subsequent organizationwide initiatives.

Methods: We conducted semistructured interviews with eight current and former clinical and administrative leaders from the KP San Francisco Medical Center and national headquarters. Interviews were analyzed for key themes.

Results: KP San Francisco Medical Center developed linguistic and cultural services in response to a confluence of external and internal factors, including changing demographics, care quality challenges, and patient and clinician satisfaction issues. Early strategies included development of language-specific care modules focused on Chinese- and Spanish-speaking members while meeting broader linguistic access and cultural-competency needs through a centralized Multicultural Services Center. Additional approaches across KP regions have focused on improving interpreter services, optimizing use of bilingual staff, and creating a translation infrastructure to improve quality and reduce redundancy in written translation efforts.

Conclusions: KP’s experiences developing linguistic and cultural care and services since the 1990s provide lessons about decision-making processes and approaches that may guide other health systems, insurers, and policy makers striving to improve care quality and safety for patients with limited English proficiency.

Background

An essential determinant of health care access, quality, and safety is effective communication between patients and clinicians. Increasing numbers of people with limited English proficiency (LEP) in the US make linguistic access and the provision of linguistically and culturally competent health care a common challenge. In 2000, 18% of the US population reported speaking a language other than English at home, and nearly half of those reported some trouble speaking English. Language barriers in health care are associated with decreases in quality of care, safety, and patient and clinician satisfaction; contribute to health care disparities, even among people with insurance; and challenge the health care delivery system in every type of clinical setting.

Federal and state regulations and standards oblige clinicians and insurers to provide language services so that patients with LEP have meaningful access. Highly criticized as an unfunded mandate, the guidelines and emerging patchwork of legislation have left health care organizations, insurers, and clinicians scrambling to meet regulatory requirements and clinical needs while controlling costs.

Little is known about how health systems make decisions to respond to the language challenge. Although growing numbers of institutions report using professional interpreters, other approaches to improving quality of care for patients with LEP remain opaque. In this context, health care organizations and policy makers can learn from the experiences of a large care provider. Kaiser Permanente (KP) is the nation’s largest nonprofit health plan and nongovernmental integrated health care delivery system, caring for 8.7 million members in eight geographic regions. With more than six million members in California, where 1 in 5 people speak English less than “very well,” KP must

Kate Meyers, MPP
Gayle Tang, MSN, RN
Alicia Fernandez, MD

Alicia Fernandez, MD, is an Associate Professor of Clinical Medicine at the University of California, San Francisco. E-mail: afernandez@medsfgh.ucsf.edu.
navigate the challenge of delivering care to large segments of the LEP population. Although its prepaid, integrated model differs from much of health care in the US, its experiences can nonetheless inform other organizations struggling to meet the needs of linguistically diverse patient populations. Specifically, this article addresses why and how KP decided to proceed with particular models and programs, what the key success factors are, what challenges remain, and what the implications for the field are.

Methods
We conducted a qualitative case study of the development of linguistic access services at KP's San Francisco Medical Center beginning in the mid-1990s, plus an analysis of other programs implemented more broadly. Data gathering consisted of individual, semistructured interviews with eight current and former clinical and administrative leaders from KP's San Francisco Medical Center and national offices. Institutional review board approval was obtained. One investigator (KM) conducted all interviews using a standardized interview tool and audio-taped and transcribed notes from interviews. All investigators reviewed the notes for key themes and developed this summary of findings.

Results
Linguistic Access in San Francisco
In the mid-1990s, KP's San Francisco Medical Center faced several challenges in the care of patients with LEP.
Drivers for Change
San Francisco, CA, is a highly diverse city: 46% of residents speak a language other than English at home.13 In the mid-1990s, San Francisco's Chinese population was growing, increasing from 12% of the city's population in 1980 to nearly 20% in 2000. (Steven Karet, personal communication, 2009)9 more than one-third of whom did not speak English well or at all.13 At the same time, Chinese membership trends at KP's San Francisco Medical Center were flat, meaning that market share for this population was declining.

Data from internal surveys and focus groups (as recalled by interviewees) revealed lower satisfaction with KP among Chinese-American members and nonmembers in San Francisco compared with other populations, and Chinese members with LEP reported communication challenges. KP clinicians expressed frustration about the lack of reliable and effective ways to bridge the language divide and about the implications for quality of care: interpreters were not consistently available; commercial telephone interpreter services were believed to be less than ideal; inadequate availability of bilingual support staff led bilingual clinicians to take on nonmedical tasks to assist patients, contributing to frustration and burnout; and bilingual employees were often asked to serve as interpreters without standard training or quality assurance.

Recognition of these issues arose at the same time that KP was focusing more intensely on clinical quality improvement across the organization. This enabled the San Francisco leadership to frame the linguistic access challenges as a quality and service challenge, helping provide momentum for change.

Considering Alternatives and Choosing an Approach
In the face of these drivers, several potential strategies were considered: 1) improving current language support services, 2) contracting with an external Chinese-speaking clinician network, 3) establishing a satellite clinic (or clinics) of Permanente Medical Groupb physicians in the Chinese community, 4) hiring additional bilingual clinicians, and 5) consolidating bilingual physicians and staff into a specialized care module within the San Francisco Medical Center.

Several factors were important in choosing among strategies. Preferred strategies would respond to the priorities of the Chinese population, specifically the desire for easier access to services; would be relatively easy to implement and leverage existing strengths; and would enhance market penetration and facilitate longer-term solutions for this and other populations with LEP. On the basis of these priorities, medical-center leaders chose to pursue two strategies: a Multicultural Services Center was developed to strengthen broad language support and cultural-competency services throughout the medical center, and a general internal medicine Chinese module consisting of physicians, other practitioners, and support staff who were bilingual in Chinese and English and trained in cultural-competency issues was established in late 1996.

Although several approaches would have increased access to services, the Chinese module was particularly appealing because it leveraged existing resources and involved few new costs: Most of the bilingual clinicians and staff were already employed at the medical center and could be reorganized into one care setting. The decision to create the Chinese module, however, was not based on a formal business case. In part, interviewees believed that this was because the model had good face validity and...
because the need to address linguistic access and cultural-competency issues was so glaring that people were willing to make decisions on the basis of pragmatism.

Another important consideration was the explicit recognition that patient care goes beyond the interaction between patient and physician in the examination room. When patients speak English well, their ability to navigate additional touch points (such as checking in, being roomed [assigned to an examination room], or scheduling appointments) is taken for granted. For patients with LEP, each interaction can determine the success of the clinical experience. By concentrating bilingual staff and physicians, the Chinese module not only improved the overall patient experience but also relieved bilingual physicians of the frustration associated with the nonclinical tasks that had previously fallen to them.

The Chinese module, in conjunction with activities of the Multicultural Services Center and outreach to employer groups in the Chinese community, contributed to an increase in annualized membership growth among Chinese-surname members from 1.7% in 1995 to 5.9% in 1997 (Dennis Lum, MPH, personal communication, 2007). Interviewees recalled that satisfaction data for the Chinese population and clinicians and quality of care improved with the implementation of these new strategies.

**Expanding the Reach**

Soon after the Chinese module was established, local leaders planned the formation of a similar module for the Spanish-speaking population. Some drivers were similar—opportunities for membership growth and service improvement among a quickly growing population—yet creating a Spanish module presented other challenges, including the need to hire additional Spanish-speaking physicians and nurses who could navigate linguistic and cultural challenges associated with a diverse Spanish-speaking population. Once the Spanish module was in place, both modules added multidisciplinary bilingual staff as part of a broader redesign of adult primary care, including a health educator, diabetes case manager, complex chronic conditions case manager, medical behavioral specialist (psychiatric social worker), and physical therapist, expanding their ability to provide more comprehensive care within the modules.

**Impact on Patients**

To assess the impact of the new modules on patients, KP administered surveys and conducted focus groups in 2002 among Chinese- and Spanish-speaking patients at the San Francisco Medical Center. In the surveys, module members’ ratings of their care experience was typically slightly higher than those of members not receiving care in the modules, though both groups mostly received high ratings. One area where the surveys revealed significant differences was that patients who received care in the modules were more likely to report that their physician provided enough information about the patient’s condition and treatment. Module members were also significantly more likely to say they would renew their KP membership, and that they would recommend KP to others who speak their language. Focus groups revealed more about what that care experience meant to patients. As one Chinese-speaking member of the module said, “For an English-speaker, the module is better. For a non-English-speaker, the module is vital” (Kathryn Girkensa, PhD, personal communication, 2007).

**Overcoming the Barriers**

Establishing the language modules was not without challenges. Although clinical champions were some of the most important driving forces, some clinicians resisted the idea out of concern that dealing with more patients with LEP would increase their workload if not matched by an increase in bilingual support staff, that the module would decrease the diversity of their patient population, or that a separate module amounted to “special treatment” or might appear discriminatory. In addition, the medical center needed to partner with local union groups to consider the impact of language skills on job placement and pay. Ultimately, these concerns were addressed and plans for the modules proceeded, but they highlight some of the barriers and challenges that can arise. The modules did not meet resistance from patients, who could opt in or out of the modules depending on their linguistic needs and physician preferences.

**Providing Care Outside the Modules**

The Chinese and Spanish modules addressed some core care delivery needs for the two largest populations with LEP in San Francisco, but because they addressed only adult primary care for these two large groups, additional action was needed for other medical specialties, care settings, and languages. The San Francisco Medical Center’s Multicultural Services Center provided a foundation of services to meet LEP members’ needs systematically, from the initial point of contact to the clinical encounter and follow-up care. This included internal and vendor-based interpreter services, document translation, signage, publications, phone hotlines, a Chinese interpreter call center, and...
training for staff and clinicians on cultural-competency issues and the importance and availability of language services. Performance metrics included patient satisfaction, costs and use of internal and outsourced services, efficiencies in scheduling, and demand for services. Challenges have included perceptions of the services as ancillary, clinician and patient resistance regarding use of interpreters, and building capacity for services in other languages beyond Chinese and Spanish.

**Diffusing Linguistic and Cultural Competence**

In the years since the Chinese and Spanish modules were established in San Francisco, other KP facilities across the US have grouped physicians and staff with special expertise to serve members with LEP and other distinct needs. In addition, three other strategies to improve care quality by addressing cultural and linguistic needs are being broadly adopted across the organization.

**Increasing the Availability of Qualified Interpreters**

KP’s unmet need for formally trained health care interpreters, related training programs, and performance standards—and the implications for quality and safety—led the organization to design a health care interpreter training curriculum in 1996. In collaboration with City College of San Francisco, this curriculum was successfully expanded into the formal 15-unit Health Care Interpreter Certificate Program, whose goal is to develop a large pool of linguistically and culturally competent interpreters and other staff in health care settings.14,15 The program has been disseminated to 15 additional geographic areas, and more than 1000 students with specialties in 15 languages have graduated from the certificate program at partnering colleges.

**Leveraging Bilingual Staff**

With demand for interpretation skills outpacing supply of on-site qualified interpreters, KP has turned to its own diverse workforce for a solution—while recognizing that ethnic diversity does not ensure linguistic and cultural competency.11 The Qualified Bilingual Staff (QBS) program aims to capitalize on existing workforce diversity, provide professional development opportunities for staff, and ensure qualified linguistic services and culturally competent care at every point of contact in a cost-effective manner. QBS uses a standardized approach to identify workforce capacity, assess levels of linguistic competency, enhance linguistic and cultural capabilities, mobilize QBS within the care system, and monitor to ensure continuous quality improvement and patient safety.

Currently, the model targets the languages most prevalent in KP’s service areas, including Spanish, Chinese, Vietnamese, Tagalog, Russian, Hmong, Punjabi, and American Sign Language. The organization has designated nearly 10,000 QBS employees (who receive a pay differential based on level of linguistic proficiency) and certified more than 100 QBS trainers across several geographic regions. This model has also been disseminated to external health systems. In addition, KP has expanded QBS to include assessment of physicians’ linguistic and cultural proficiency, with more than 800 physicians assessed to date.

**Improving Efficiency and Quality of Translation Services**

Translation of written materials—such as patient education, consent forms, and insurance documents—is critical to linguistic access and presents additional challenges. Like many other large organizations, KP has historically dealt with translation on a local, ad hoc basis, resulting in problems with accuracy, cultural appropriateness, and redundancy. An internal survey of clinicians and staff revealed several challenges, including lack of knowledge on how to access translated materials, lack of budgets for translation, lack of organizational structure to share and access materials, questionable quality of translated information, significant delays in completing translations, and limited availability of materials even in the most common languages.16

Faced with these challenges, the organization is testing changes to improve quality and efficiency through a virtual translation environment. This platform uses translations management technology—embedded with evidence-based quality-assurance processes—to enhance efficiency and ensure quality in translations. This standardized quality translation infrastructure aims to avoid redundancy, maximize economies of scale, and ensure consistency. By testing how centralizing services affects quality, costs, work flow, and turnaround time for translations, the organization is gaining experience to build a longer-term translation infrastructure.

**Discussion**

**Critical Success Factors**

According to our interviews, three factors enabled innovations at the San Francisco Medical Center and across the organization:

- First, the confluence of external...
and internal forces, such as changing demographics, declining market share, and increasing focus on quality, service, and safety, were critical to motivating improvement in linguistic access in San Francisco. These factors created a “policy window”—an opportunity to respond to specific needs with innovative changes.

- Second, in San Francisco the shared vision of local leaders opened doors and aligned stakeholders, and a diverse group of strong operational champions motivated and carried out the work. Their partnership addressed early hurdles and ensured that services progressed from concept to reality. Local and national improvement efforts were also enabled by KP’s strong infrastructure for systematic diversity efforts, centered in the National Diversity office and mandated by the National Diversity Agenda, both of which provide a strategic platform for the work.

- Third, characteristics and incentives specific to KP’s structure supported these innovations. As a prepaid care delivery system, the organization uses global budgets (not billing and reimbursement), enabling a degree of financial flexibility. As an integrated, multispecialty group practice, it encompasses the entire continuum of care, from primary care and specialty physician offices to hospitals (in some regions), pharmacies, and beyond. This provides the potential to set up consistent services in different points of the delivery system. Integration also enables sharing best practices and using common approaches, systems, and measures.

**Challenges and Implications**

The interviews and literature review revealed a number of linguistic access challenges for the health care field. These highlight potential areas where policy intervention—by government, accrediting bodies, employers, insurers, and health care delivery organizations—might accelerate progress.

The lack of funding streams or billing mechanisms for most linguistic access services is perhaps the biggest barrier to provision of these services by fee-for-service health care organizations. KP’s prepaid, integrated structure creates more flexibility and incentives to provide these services where needed, though even in this model, competing priorities abound.

An integrated health care system such as KP benefits from the ability to make changes to multiple touch points where people receive care and interact with the system. In contrast, physician practices or hospitals that are not part of a larger system may be challenged by their lack of influence over other parts of the care-delivery continuum—where even if they improve linguistic access and cultural competency in their own care setting, they cannot ensure that their patients will receive similar services in other health care encounters, potentially undermining gains in satisfaction, efficiency, and quality.

Consistency of services and spread of best practices can also be impeded by “silos” of work, especially in large organizations. Efforts to improve care for patients with LEP could gain more traction by connecting to other major organizational initiatives in quality, patient safety, and service/care experience that may otherwise overlook linguistic access issues. In addition, linguistic services are likely to have more impact if they are logistically easy to access and integrated into routine work processes and if physicians understand the quality rationale and are involved in the development and implementation of services.

Finally, health care organizations are challenged by the sheer volume and complexity of issues related to linguistic access—including the need for standards for assessment, training, and certification of interpreters and dual-role bilingual staff; best practices for using interpreters versus bilingual staff; high-quality, cost-effective document translation; strategies for engaging clinicians so that they use language services; needs across the care continuum; and metrics to assess quality of services, patient satisfaction, and outcomes.

These success factors and challenges reveal important implications and options for accelerating progress:

- **Provide leadership.** Progress in linguistic access requires leaders’ attention to the problem and commitment to identifying solutions. Increasing regulation alone is likely not enough to compel meaningful and sustained action. Organizational leaders—at micro and macro levels—and a diversity infrastructure are key drivers of progress and sustainability.

- **View regulation as a catalyst.** Linguistic access regulations or accreditation standards have had a mostly positive impact and provided motivation to address some existing problems. However, lack of enforcement or clear definitions of how these services should be integrated into the totality of patient care, from making appointments to dispensing medications, reduces their impact.

- **Understand the population.** Health insurers and care-delivery organizations, potentially in part-


**QUALITATIVE CASE STUDY**

Responding to the Language Challenge: Kaiser Permanente’s Approach

nership with employers and other payers, can take a greater role in understanding the linguistic preferences and capabilities of their populations. The routine collection of data on preferred primary language, as well as data on race and ethnicity, can help inform linguistically and culturally responsive approaches.

- **Create incentives for linguistic access.** A key obstacle for proliferation of linguistic access services is the lack of payment streams. These services are essential to delivering high-quality and efficient care, and policy makers, employers, and other payers could work with insurers and care providers to identify realistic opportunities to establish incentives and drivers.

- **Increase the pool of qualified providers.** Inadequate numbers of and standards for qualified interpreters or bilingual/bicultural clinicians and staff impede progress. Establishing such standards and creating policies to increase their numbers (including creating incentives or requirements for linguistic access services) will help ensure high-quality and reliably available linguistic access services.

- **Integrate linguistic services into clinical care.** KP’s Chinese and Spanish modules represent only one way of integrating linguistic services into routine clinical care. Health care organizations can make less-intensive changes to workflow and scheduling to improve linguistic access for patients.

- **Establish standards and metrics.** Performance measures for linguistic access have often been limited to volume of interpreter encounters and languages spoken. More meaningful metrics that evaluate the proportion of patients with LEP receiving linguistic access services and the quality and impact of those services are needed. In addition, establishing standards for appropriate use of services would help guide health care organizations in developing programs and allocating resources.

As the diversity of the US population continues to grow, the challenges of effectively providing high-quality clinical care will likewise increase. The fragmented nature of US health care will likely result in a myriad of approaches to the language challenge. KP’s experience developing linguistic access programs in San Francisco and across its regions provides a snapshot into one organization’s decision-making process and approach, and its lessons can be applied more broadly across the health care system.

---

**References**


11. Chen AH, Youdelman MK, Brooks J. The legal framework for language access in healthcare settings: Title VI

---

**Disclosure Statement**

The author(s) have no conflicts of interest to disclose.

**Acknowledgment**

Katharine O’Moore-Klopf, ELS, of KOK

Edit provided editorial assistance.
Responding to the Language Challenge: Kaiser Permanente’s Approach


Close to the Ground

Language is not an abstract construction of the learned, or of dictionary makers, but is something arising out of the work, needs, joys, affections, tastes, of long generations of humanity, and has its bases broad and low, close to the ground.
— Noah Webster, 1758 – 1843, American lexicographer
Interview with Lawrence Weed, MD—The Father of the Problem-Oriented Medical Record Looks Ahead

Lee Jacobs, MD

I first met Lawrence Weed, MD, in 1972 when I was a third-year medical student at the University of Vermont. To this day I remember his passion for a disciplined approach to medical record documentation to optimize the care provided to each individual patient.

Now, 35 years later, I was privileged to meet with Dr Weed at his home in Vermont. We discussed when he first was alerted to the nonscientific approach clinicians use to make decisions on patients. The rest of the interview time was spent with Dr Weed teaching me about the solution that he has spent the last 30 years designing and implementing.

This interview is published to complement the editorial in the most recent issue of The Permanente Journal (Spring 2009;13[2]:85-7). We believe that in the era of health care reform and quality improvement initiatives, it is important that the medical community take a close look at Dr Weed’s total approach decision-making information support defined in this interview.

— Lee Jacobs, MD

The Genesis of the Problem-Oriented Medical Record—The Journey Begins

Lee Jacobs, MD (LJ): First Dr Weed, could you take us back to the beginning when you first realized that physicians needed the problem-oriented medical record (POMR)?

Lawrence Weed, MD (LW): The true depth of the knowledge problem in medicine occurred to me when I found myself doing basic research in biochemistry at a university medical school. As a scientist in the laboratory I was dealing with one problem at a time, making time and tasks the variable and achievement the constant. When I understood the problem, I wrote up my findings, had them audited and revised when necessary, and finally published in a journal.

During this time doing research, because of my clinical background and combined appointment on the faculty, I was asked to teach clinical medicine on the wards a couple months a year. It was at this point that the true nature of our predicament dawned on me.

As I wrote in 1969, “The beginning clinical clerk, the new intern, and the practicing physician are confronted with an apparent contradiction. Each is asked, as a whole physician, to accept the obligations of meeting many problems simultaneously and yet to give to each the single-minded attention that is fundamental to developing and mobilizing his or her enthusiasm and skill, for these two virtues do not arise except where an organized concentration upon a particular subject is possible.”

The multiplicity of problems the physician must deal with every day constitutes a principal distinguishing feature between a physician’s activities and those of many other scientists.

These realizations led me to develop the POMR so that medical students and practitioners could function in a structured, rigorous way more like that of workers in the scientific community. The POMR cannot change the multiplicity of problems that physicians face. But the POMR enables a highly organized approach to that complexity.

LJ: Not uncommonly, individuals have ideas on how to improve a system but are unable to get their innovation adopted. Tell us how your idea on the POMR went from a concept to being implemented worldwide as a standard for medical documentation.

LW: Although I would like to believe that my traveling and lecturing around the country and abroad helped promote the POMR, we must recognize the enormous contribution of Harold Cross, MD, in Hampden, ME. He set up a problem-oriented medical practice after an internship at the Eastern Maine General Hospital in Bangor, ME, where I first started the POMR as Medical Director of the hospital. Dr Cross was joined in his office by...
John Bjorn, MD, and later Charles Burger, MD. Together they created a practice model for their office that demonstrated for the world what a problem-oriented system could do. The medical community needs to see that an innovation is indeed successful in a medical practice before they consider adopting it.

LJ: I remember visiting their office in Hampden, ME in the early 1970s. It was truly an amazing demonstration of the value of the POMR. For example, I recall how they tracked their patients’ problems so well that they were able to retrieve all patient records for a given problem and would periodically invite specialists to review those records and assess how they handled various disease entities. It was an impressive quality improvement approach—made possible because of their discipline in applying the principles of the POMR.

Could you tell our readers how this innovation in record keeping moved from the outpatient practice demonstration of Drs Cross, Bjorn, and Burger to become accepted in academic settings?

LW: A most important contribution was from Franz Ingelfinger, MD, the Editor of the New England Journal of Medicine (NEJM). He had heard about my rounds and lectures on the Harvard service at the Boston City Hospital and so, in 1968, he asked me to write the article entitled “Medical Records that Guide and Teach.”

Equally important was the contribution made by two leaders in American medicine, Willis Hurst, MD, and his coworker Kenneth Walker, MD, in Atlanta, GA. Not only was Dr. Hurst a chairman of a department of medicine in a leading medical school (Emory), he also authored major medical textbooks. In 1971, he took the time to write an editorial in NEJM entitled “Ten Reasons Why Lawrence Weed is Right” and then proceeded to set up two major conferences on the POMR for people from all over the country to attend.

It was this combination of demonstrating value in an actual medical practice along with publication in a major medical journal and leadership by respected clinicians that led to the POMR being adopted worldwide.

Life Beyond the Problem-Oriented Medical Record—The Next Challenge

LJ: Practitioners worldwide adopted your problem-oriented approach to medical records. When the POMR came into common use, were you satisfied at the time that the POMR would be the final solution for the information dilemma you first encountered on the wards as an attending?

LW: No. The POMR surfaced the need for new tools to move knowledge differently when caring for a patient. Accordingly, during the 1970s, I led an effort to develop an electronic version of the POMR designed to solve the problem of information retrieval.

However, solving the retrieval problem with computers uncovered an even greater processing problem—integrating detailed patient data with comprehensive medical knowledge. Computer technology maximized access to voluminous data and knowledge, thereby exposing the limited information processing capacity of the human mind. Scientists cope with this limitation by controlling the research environment, defining the variables involved, and limiting the scope of their investigations. Practicing physicians do not have that luxury. The time constraints of practice and the enormous scope of information implicated by multiple problems in unique patients make it impossible for the human mind to function with scientific rigor. Physicians inevitably resort to dangerous cognitive shortcuts.

I realized that medicine must transition from an era where knowledge and information processing capacity resides inside a physician’s head to a new day where information technology would provide knowledge and the processing capacity to apply it to detailed patient data. The physicians’ unaided minds are incapable of recalling all the necessary knowledge from the literature and processing it with data from the unique patient. An epidemic of errors and waste is occurring as we persist in trying to do the impossible. Changing this requires that we recognize the crucial distinction between electronic access to information and electronic processing of information. This requires a rational standard of data organization in medical records. Yet, these points are still not recognized in most current discussions of health information technology.

As a result, I have been involved for the last 60 years in trying to design and develop a medical care system in which patients are no longer dependent on the limited, personal knowledge their caregivers happen to possess. The medical care system must resemble the transportation system, where consumers use knowledge captured in maps, road signs,
The physicians’ unaided minds are incapable of recalling all the necessary knowledge from the literature and processing it with data from the unique patient.

Computerized navigation devices, and the like at the time of need. Patients, like travelers, will be expected from childhood on to develop the necessary skills to navigate the system.

At all times, patients should be supported by caregivers who are highly trained in the necessary hands-on skills, like removing the appendix or listening to heart sounds, just as in the travel system there are pilots, mechanics, air-traffic controllers, and others who perform functions that travelers cannot perform.

LJ: At national conferences I have heard you eloquently make the case that the present practice of medicine is flawed in that it primarily depends on the physician's limited memory and processing capacity when dealing with complex patient issues. What is your solution?

LW: To deal with this reality I have spent more than 30 years developing and implementing what I have called “knowledge couplers.” Medical knowledge is used to select and analyze patient data, coupling the data in a matrix fashion with medical knowledge developed through research. The output of this coupling process is an organized display of options and evidence. This is far superior to that derived from a physician’s memory or analysis.

Although there may be other similar tools available, I can assure you that any automation that reliably couples patient data with the world’s medical research will be dramatically better than the unaided human mind.

LJ: I want to make it clear to the readers and in the spirit of full disclosure that your intent today is to advocate reforms in medical practice, including, but not limited to, the use of such tools as the knowledge couplers, rather than promote an approach from which you would have financial gains. Is that true?

LW: Yes. It is also true that I could gain financially if the knowledge coupling software that my colleagues and I first developed were to be widely adopted. However, that software is just a particular implementation of the generic concept of an electronic tool for applying medical knowledge to patient data. Others are free to build and disseminate their own implementations of the concept.

It is crucial to understand, however, that software of this kind is just one of three basic elements of reform that I advocate. The other two elements are the POMR and reform of medical education and credentialing. The POMR is essential not only for patient care itself but also for feedback on the medical knowledge captured in knowledge coupling tools.

LJ: So you are saying that these computer-supported couplers that you have described should not be used separate from the POMR?

LW: Absolutely. Couplers are a software tool that should be directly linked to the POMR. If couplers and the POMR are not linked, the full potential of each will never be realized.

The Coupling Process—How do Knowledge Couplers Really Work?

LJ: Could you give us an example of how knowledge couplers might help a physician in decision making? How do they work?

LW: Let’s use an acute abdomen as an example. Careful review of the literature shows that investigating this symptom should take into account scores of diagnostic possibilities that involve most medical specialties. Each diagnostic possibility can be represented in software as a combination of simple, inexpensive findings from the history, physical, and basic laboratory tests. Checking all of these items for all of the diagnostic possibilities yields a set of positive findings on a given patient. Each positive finding suggests one or more diagnostic possibilities. The software matches each patient’s particular combination of positive findings against all of the combinations of findings representing the diagnostic possibilities for a patient with an acute abdomen problem. This matching process yields a set of diagnostic possibilities along with the patient’s positive and negative findings for each. These findings constitute initial evidence for and against each possibility. The possibilities for which at least one positive finding is made are the diagnoses worth considering for that patient. Those possibilities for which no positive finding is made are not worth considering for that patient.

By comparison, physicians rarely use computer software to assemble patient data and medical knowledge into options and evidence for medical decision making. Instead, physicians rely largely on personal intellect—“clinical judgment”—for this pivotal function. Therein lies the flaw.

LJ: As a consultant, you have reviewed many charts and over the years you have led many patient care rounds. Do you have an example that especially stands out for you in which the physician’s recall of facts was inadequate in arriving at a correct diagnosis?

LW: Here is one of many possible examples. A case that was described to me after the fact involved an eight-year-old girl complaining of severe abdominal pain. She was admitted to an emergency room at a teaching hospital. Two physicians saw her and noted a normal abdominal examination. Vomiting was also noted but not discussed. The girl’s national origin,
however, led the physicians to observe that she had a “Mediterranean temperament” suggesting that her complaints may be an overreaction to a little gastroenteritis. The physicians concluded she could go home. Fortunately the nurses thought the girl’s vomiting was excessive for simple gastroenteritis. Rather than allowing her to go home, the nurses elected to wait for the next shift when a new set of physicians could see the girl. Two new physicians focused on possible right lower quadrant pain, diagnosed appendicitis, and took her to the operating room. Surgery revealed not appendicitis but intestinal obstruction.

What would have happened in this case if the physicians or the nurses, or the patient’s own family had used computerized support such as the knowledge couplers? Since couplers were not used at the time of this patient’s encounter, the best way to answer this question is to enter the limited data available from the girl’s medical record into the knowledge coupler for diagnosis of “acute abdomen.” The coupling of the girl’s medical record data with the coupler’s database of medical knowledge results in a list of possible diagnoses suggested by one or more of the findings on the girl, together with evidence, positive and negative findings, for and against each possibility. Also included are additional findings to check, along with commentary useful for evaluating the evidence and weighing the possibilities.

One of the possible diagnoses suggested by the coupler was appendicitis, but it was a poor match with the medical record findings entered in the coupler software with only one finding consistent with this diagnosis. The diagnostic possibility that best matched the findings was small bowel obstruction.

In short, the correct diagnosis could have been easily identified in the first 15 minutes of care. What happened instead was 4-6 hours of delay in the emergency room, with two mistaken diagnoses along the way, before surgery was undertaken. The associated suffering, risk, expense, and waste entailed by reliance on the physicians’ clinical judgment were unnecessary.

LJ: You mentioned at the beginning of this dialogue that one reason that the POMR caught on was because people could see how it worked in a real life medical practice in Hampden, ME. Are there similar demonstrations of the knowledge couplers in practice?

LW: Absolutely. With regard to the introduction and spread of knowledge couplers we must recognize what Kenneth Bartholomew, MD, has accomplished building a working model of his small practice in Faulkton, SD. He has written a classic article in a chapter in my book on the knowledge couplers. This model led to the very important work of Dr Charles Burger, who set up a practice in Bangor, ME, based on knowledge couplers and POMR. Additionally, Dr Bartholomew has an exciting proposal that would integrate couplers communitywide in both ambulatory as well as hospital care settings. If funding is forthcoming, this could provide the nation with a major pilot project demonstrating what we should be doing around the country.

Medical Education—Medical Student Recruitment and Education

LJ: Let’s build on this discussion of the flaws of decision making when based on the physician’s memory. You have expressed concerns with both the type of individual accepted in medical school as well as how medical students are taught in their first two years. Could you tell our readers what you see as the issues and the implications to preparing these students to practice medicine?

LW: Today, students are recruited on the basis of how well they memorize and regurgitate facts. In the future because knowledge will be in information technology tools instead of in heads, students should be trained in the reliability of performance of given tasks that will be part of a complete medical care system. Students should be selected for their hands-on skills and interpersonal skills and not on the basis of their memory and regurgitation of facts. They should be required to acquire competence in discrete skills and procedures, and their licenses to practice should be correspondingly limited. Medical education should become a system of teaching a core of behavior instead of a core of knowledge.

LJ: So instead of memorizing the Kreb’s Cycle, students should learn how to solve patient problems, relying on information tools and not having to recall a myriad of facts. Is that a good summary?

LW: Absolutely. Have you ever wondered why PhDs instead of MDs teach the first two years of medical school? It is because the first two years are consumed with transmitting abstract knowledge that is not effectively coupled with medical practice.

LJ: When these medical students trained in medical problem solving graduate, do you envision that the world in which they will practice would be different from today?

LW: It will be very different. The practice of medicine must become a defined and coordinated system of tasks and reliable performers—just like the airline system is a combination of pilots, mechanics, radar-skilled performers, and others, along with educated consumers who learn their roles from childhood on. The

In short, the correct diagnosis could have been easily identified in the first 15 minutes of care.
The present system of medical schools teaching knowledge and graduating physicians performing as they do now will become an anachronism.

LJ: Your writings make a very compelling argument for these changes in medical education. Yet, such changes are largely absent from health reform debates. Why do you think there has been such a complete lack of a dialogue on the subject? If educators disagree, why aren’t they saying so?

LW: The system that I just described is very threatening to many educators who are now in the business of moving knowledge through heads instead of using information technology such as knowledge coupling tools. They are judging students on how much they know instead of how well they perform in a well-defined and audited system of care. Medical educators just don’t understand the need to change. It is like trying to sell airplanes to those who own the railroads.

LJ: Let’s say that medical educators and practitioners come to the point of accepting the limitations of the human mind and want to incorporate knowledge couplers and the POMR standard of care into the training and practice of medicine. What might this new culture look like?

LW: I would envision a national library of knowledge couplers integrated with computerized POMR. The couplers would be constantly updated as new knowledge is harvested from the structured medical records and from the work of scientists working in laboratories. Everyone in the medical community, including patients and all caregivers in outpatient and inpatient settings, would use updated knowledge couplers to make clinical decisions.

Reform of medical education and credentialing is essential to change how caregivers function, to open the marketplace to competition by nonphysician practitioners, and to allow provider organizations to redesign medical practice.

Knowledge Couplers and Evidence-Based Medicine—What’s the Difference?

LJ: As you know, the last decade in clinical practice support has given birth to a discipline called evidence-based medicine (EBM). How are automated tools such as knowledge couplers different from EBM and practice guidelines?

LW: Both are fundamentally supported by medical literature. However, EBM is based on a misguided use of statistical knowledge instead of the unique set of details from a given patient. A truly EBM system could develop if evidence would be used to individualize care rather than standardize it.

Physicians are increasingly expected to apply knowledge derived from large population studies and clinical trials. Referred to as evidence-based medicine, this approach is rightly intended to prevent physicians from following arbitrary local practices and unsupported personal judgments. But this approach systematically excludes the individualized knowledge and data essential to patient care.

As an example, consider the following case described in a January 1996 NEJM article. The patient complained of severe fatigue. For months, many thousands of dollars were spent, and the patient almost died. Yet, the correct diagnosis—Addison’s disease—could have been made at the outset of care using the right tools in a defined system. The physicians involved did not even consider Addison’s disease until the patient was near death. Addison’s disease would be a low priority for investigation in an evidence-based ranking of diagnostic possibilities, because, statistically, it is rare in the general population. Moreover, in this patient no single finding seemed specific to Addison’s disease. But the patient’s combination of findings, such as fatigue, hypotension, weight loss, abnormal pigmentation, dehydration, nausea, and abdominal pain, were highly specific to Addison’s disease. If patients with this combination of findings are viewed as a subpopulation, then it becomes obvious that Addison’s disease is common, not rare, for that population. But the medical literature cannot individualize the evidence in this way. A new kind of information tool is needed for practitioners to recognize the associations between individual combinations of findings and relevant medical knowledge.

This applies to therapeutic as well as diagnostic decision making. No one would expect travelers to conform to some “evidence-based” determination by experts of the “best” route across the country. The best route depends on individual characteristics, needs, and preferences. Similarly, in medicine, no one should think that two different people labeled with the “same” disease necessarily have comparable medical needs. Nor should we think that the care of unique individuals must conform to “evidence-based” guidelines derived from large population studies. Rather, high-quality, efficient care would emerge case by case, in a progression of many small steps, each one carefully chosen and reliably executed.

LJ: Sounds like you agree with a recent editorial in the Journal of the American Medical Association (JAMA) in which the authors concluded “Guidelines are often too narrowly focused on single disease … and few if any guidelines help clinicians...
in managing complexity.” They go on to state what you just did that “Guidelines are not patient-specific enough to be useful and rarely allow for individualization of care.” I guess you would applaud such a statement.

LW: Absolutely. EBM in its present form is slow and unfit to move from the population-based generalizations of medical knowledge to the remote and heterogeneous instances of unique patients. Moreover, EBM leaves unsolved the “needle in a haystack” problem—the difficulty of coupling vast knowledge with detailed data to find the crucial combinations of details relevant to an individual patient.

Because the mind more readily comprehends generalities about large populations than detailed data about individual variation, EBM is oriented toward population-based forms of evidence that poorly describe the realities of unique individuals. Indeed, that orientation characterizes medical knowledge in general.

A Final Question

LJ: Dr Weed, you have had an amazing career implementing a needed change in how patient data is handled through the POMR. Today, you outlined another major change that needs to be incorporated if the practice of medicine is to be improved. On the basis of your experience as an innovator, and knowing what you know today about medical education and the practice of medicine, are you optimistic such changes will be forthcoming?

LW: Based on what I know about all the vested interests in the present medical education system and in the present practice of medicine, I am not optimistic such changes will be forthcoming.

For change to occur, it will take extraordinary leadership with the power to switch all the capital and resources now going into a misguided form of medical education to a National Library of Couplers and a whole new paradigm for medical education and practice as described in Section VIII of the Medicine in Denial paper. A paradigm in which knowledge is in tools instead of heads, in which patients from childhood on are involved in the use of those tools in their own care, and in which there is a new division of labor among clinicians.

If change is to come, it will take courageous leadership from present day Ingelfingers and Hursts. If the medical establishment and the government fail to lead the change, then patients will demand such a change once they understand the deep faults in the present system.

LJ: Do you believe people will heed your warning?

LW: There were many warnings of the disaster coming in the financial system and all were ignored. The present health care system is a medical and financial disaster, and perhaps only the disaster itself will get bad enough to change the status quo. My fear is that the government will spend billions computerizing the present chaos and will remain unaware of the fundamental changes that are so badly needed.

LJ: Thank you Dr Weed.

References

1. Weed LL. Medical records, medical education, and patient care: the Problem-Oriented Medical Record as a basic tool. Cleveland (OH): Press of Case Western Reserve University; 1970.


Please note: The Permanente Federation and the Permanente Medical Groups do not endorse or oppose the opinions or ideas expressed in this book.

“Medical education and medical practice ignore a truth grasped by Francis Bacon 400 years ago. A root cause of a major defect in the health care system is that, while we falsely admire and extol the intellectual powers of highly educated physicians, we do not search for the external aids their minds require.”

— Lawrence Weed, MD

“The sole cause and root of almost every defect in the sciences is this: that whilst we falsely admire and extol the powers of the human mind, we do not search for its real helps.”

— Novum Organum: Aphorisms [Book One], 1620, Sir Francis Bacon

“She could not eat or sleep, grew visibly thinner, coughed, and, as the doctors made them feel, was in danger. They could not think of anything but how to help her. Doctors came to see her singly and in consultation, talked much in French, German, and Latin, blamed one another, and prescribed a great variety of medicines for all the diseases known to them, but the simple idea never occurred to any of them that they could not know the disease Natasha was suffering from, as no disease suffered by a live man can be known, for every living person has his own peculiarities and always has his own peculiar, personal, novel, complicated disease, unknown to medicine—not a disease of the lungs, liver, skin, heart, nerves and so on mentioned in the medical books, but a disease consisting of one of the innumerable combinations of the maladies of those organs.”

— War and Peace, Book Nine, Chapter 16, 1869, Leo Tolstoy
Biostatistics 101: Understanding Data

David Etzioni, MD, MSHS
Maher A Abbas, MD, FACS, FASCRS

Introduction

Kaiser Permanente (KP) is a leader in health care delivery and provides care for millions of Americans in several regions and states, including Northern and Southern California, Colorado, Georgia, Hawaii, Ohio, the Northwest, and the Mid-Atlantic States. The volume of clinical care rendered every year throughout the organization presents a great opportunity for research and innovations. In recognition of the importance of research, the Kaiser Foundation Research Institute was created in 1958 to administer and support research within KP at a national and regional level. High-quality innovative translational research is performed every year, in the form of randomized clinical studies, epidemiologic research, retrospective databases review, and health care policy research. Supported by an electronic medical record and computerized databases, KP is well-suited to provide the scientific community with a wealth of data on outcome of interventions. In 2007, there were approximately 2800 active studies, all approved by institutional review boards, being conducted nationally. That same year, reports on 571 studies were published by KP physicians and scientists in prestigious medical, surgical, and scientific journals, including The Permanente Journal.

Because of the size of the KP population, KP research studies often contain a large number of study subjects. Such projects and endeavors can generate complex data and results that require analysis to demonstrate the effect of therapies and interventions, to establish the efficacy or limitation of treatments, and to prove or to refute a scientific hypothesis. An understanding of biostatistics is critical to the researcher investigating clinical questions. Equally important is an appreciation of statistics by the reader and interpreter of published studies. As with all fields of scientific endeavor, statistics encompasses a rich jargon that is necessary to abbreviate and refer to underlying concepts. In this article, the first of a three-part series on statistics for clinicians, we begin with an overview of how statistics can and should be used to describe data.

Types of Data

Data are available in a wide range of types, and understanding the type of data at hand is a crucial first step in any statistical analysis. Broadly speaking, data can be quantitative or qualitative. Quantitative data are reported in units of measurement. There are two main categories of quantitative data:

• **Continuous data** represent measurements on a spectrum, where a data element can have any one of an infinite number of intermediate values. Age is an example of this. Whereas age is generally reported in years—for example, 45 years of age—there is no reason why it could not be reported in tenths or hundredths of years, such as 45.3 years or 45.36 years.

• **Discrete data** represent whole-number measurements that cannot be split—for example, number of children or number of previous hospitalizations. Clearly the number might vary widely from person to person, but there is no possibility for a value that is not a whole number.

Qualitative data are reported in categories. As with discrete data, there is no opportunity for an intervening value. The main difference between qualitative data and continuous data is that every data element has a value from a preconceived list of possibilities. There are two main categories of qualitative data:

• **Ordered data** represent measurements along a spectrum—for example, a visual pain scale with options of “no pain,” “mild pain,” “moderate pain,” and “severe pain.”

• **Discrete data** represent mutually exclusive options that do not occur along a spectrum. Race/ethnicity is a common example of discrete data.

Describing Data

Different types of data are described differently. Qualitative data can be reported adequately with a report of frequency, in a simple table. Reporting quantitative data is somewhat more complicated. In describing
a set of quantitative observations, we generally rely on measurements of the center and the distribution of the data.

The center of a set of quantitative data is usually reported in one of two ways—the mean (average) value or the median. The median value of a data set is simply the middle value of the list of measurements when it is ordered from least to greatest.

The distribution of a data set is described according to the spread of its values, and several terms are used toward this end. Variance and standard deviation are related terms that measure the amount by which observations in a data set differ from the central (mean) value of the data set. Standard deviation is simply the square root of variance.

In addition to quantifying the distribution of values in a data set of quantitative, continuous measurement, it is also important to know the character of the distributions. Initially, this is best done using a histogram. In an example of 1000 measurements of height taken from a fictional educational institution—Biostats Junior High—the mean (average) height is 62.1 inches and the standard deviation is 3.0 inches (Figure 1).

The shape of this curve is common among data sets of continuous measurements and is often referred to as a normal or “Gaussian” distribution.

Knowing that this data set of 1000 observations has this classic bell curve empowers researchers to use a broad range of statistical techniques that assume that this type of distribution is present. One example of such a technique is a convenient rule of thumb regarding standard deviation (SD). In general, for normally distributed data sets, two-thirds of observations will occur within a range that is encompassed by the mean ± 1 SD and 95% of observations will occur within the mean ± 2 SD.

Now, what if the underlying distribution of the data is not normal? In another example—Statistics Summer Camp, which has 700 junior high school students and also a group of 300 younger students—the mean height is 55.8 inches, the SD is 9.9 inches, and the histogram of height looks like Figure 2.

Will our rule of thumb still hold? Within the range encompassed by the mean ± 1 SD, 634 students (63.4%) are fairly close to our two-thirds rule. A total of 978 (97.8%) observations are within the range of the mean ± 2 SD. Despite the fact that our data set is markedly non-normal, our rule of thumb still holds up fairly well. In these situations, we say that our rule is (moderately) robust regarding the assumption of normality.

The concept of robustness is important when choosing statistical tests. Different testing techniques rely to differing extents on specific assumptions. In general, statistical tests all have a tradeoff between power (the ability to detect a difference when one is present) and reliance on assumptions.

In the second article in this series, we will explore issues related to the concept of a sample, plus significance testing between two groups.

Disclosure Statement
The author(s) have no conflicts of interest to disclose.

Acknowledgment
Katharine O’Moore-Klopf, ELS, of KOK Edit provided editorial assistance.
Montreal, Quebec, Canada: National Film Board of Canada, 2004.
DVD #153C 9105 208. 55 min, 34 sec.
Available for viewing at: www.nfb.ca/film/house-calls/.

Richard Della Penna, MD, is the Care Management Institute Elder Care National Clinical Lead and Director of the Kaiser Permanente Aging Network. E-mail: richard.d.dellapenna@kp.org.

**House Calls**
A film by Ian McLeod; produced by Gerry Flahive

“*One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient*”
—Harvard Medical School Address, 1927, Francis W Peabody, MD

Every physician who cares for frail older people or has aging parents, relatives, and friends has much to learn from this film. It is a proverbial “must see.” This is especially true for those who have never had the enriching and transformative experience of making home visits to their patients who can no longer easily come to their offices because of their conditions. This 55-minute documentary provides at once a joyful and distressing glimpse into the lives of three people who call Mark Nowaczynski, MD, their doctor. It gives physicians the opportunity to get beyond the walls and isolations of hospitals and medical offices and reconnect with the humanity of their patients.

Dr Nowaczynski identifies himself as a passionate photographer and a committed physician who makes regular home visits to essentially home-bound patients. Joe, age 86 years, has Parkinson’s disease and lives in his own home. Connie, age 93 years and partially blind, has a heart condition, recently fractured her arm; all this and her reluctance to allow someone help her bathe have her oscillating between her apartment and a retirement home she cannot afford. Ria, lives at home at age 90 years, and has severe osteoarthritis and pain in her knees.

The film is the result of Dr Nowaczynski’s desire to bring viewers into the hidden, solitary lives of older people who are so isolated that “Nobody knows they are there.” He also uses his photographs to demonstrate a compelling case to change the fee schedule of the National Health program of Canada, which does not permit more than 20% of a physician’s billings to come from house calls. He wants to see a change in the current policy, which mandates that the elderly require bathing assistance before becoming eligible for any home support.

The video brings the viewer into the homes of these three wizened and very proud old people. The stories of Joe, Connie, and Ria are told through words and images. Their fierce independence, personal history, and daily challenges reveal the richness of their lives, as Dr Nowaczynski’s photographic images of them are revealed in the red glow of the dark room. They are not just patients with medical conditions. Simply said, they are people like the rest of us with pasts, presents, hopes, beliefs, and goals.

Joe is a crusty guy who lives with his cat, who makes a full pot of coffee every day hoping that someone just may drop in. Having invested wisely, he does not have the mindset to use some of his considerable assets to pay for help. He recounts the details of a recent bedtime fall. He lay on the floor all night and part of a day before being rescued by a friend who happened to come by. Joe rejects Dr Nowaczynski’s suggestion to buy one of “those scooter things” but accepts a walker that allows him to get beyond the outer limit of his world, his front porch.

Connie is living on the edge of independence with her cat Oscar, her “boyfriend,” who gives focus to her life. She sees herself as not much use to anybody. “I fill in the days … I would like to do more … I don’t do what I used to do.” Modesty keeps her from accepting the government-required assistance in bathing that is the ticket to additional support that will allow her to stay at home. She coyly asks Dr Nowaczynski if she could wear a bathing suit during a shower. As her photograph is taken she asks “Who in the world would want to see a bunch of pictures of me? Junk!” Despite Dr Nowaczynski’s
advocacy and coaching, Connie rejects the help of an aide who arrives to bathe her and ends up living in an assisted-living facility—with Oscar and a piano on which she shows the talent she developed years earlier at the Toronto Conservatory.

Ria lives in her two-story house with the mementos of her life on the stage. She admits, “It hurts when you are left alone.” In her Germanic accent she recalls her earlier life on the stage as a little soubrette in operetta. She says she was never beautiful but she hopes she was good looking. She struggles to get off the sofa to painfully attempt to demonstrate the graceful movements of her earlier career: a curtsey, a laugh, a smile, and song and “The world is yours.” As she sits for her photographic portrait, Ria’s earlier days as a soubrette briefly come to life in her proud posture, creviced face, and the thrust of her jaw.

Medical care during recent decades seems gradually to have lost its way and much of its heart and compassion. Efficiency, throughput, and cost effectiveness have become the watchwords of success for many physicians, hospitals, and organizations. Relationships with one another and with patients seem to matter less. This development especially affects older adults who become frail and tend to spend most of their lives at home where even simple tasks become challenges. There seems to be no time to get to know patients and their worlds. Government agencies, professional organizations and physicians currently are striving to reverse this trend. They are trying to make care “patient centered” and attempting to create “medical homes.” I suspect the 55 minutes spent viewing House Calls will have more impact on quality of care, satisfaction, and physician-patient relations than most other efforts attempting to reconnect physicians with their roles as healers.

Visit the Kaiser Permanente Aging Network (KPAN) National Bulletin Web Site

The KPAN National Bulletin serves to provide a programwide network of experiences and resources.
Statistical Bulletin. This small journal, from a big company whose livelihood was totally based on statistics, was the epitome of clarity and interesting text. Graphs were always simple; the text was impeccably understandable; nowhere was there an anxious clutter of arcane symbols, followed by decimal numbers in parentheses.

Here are three wonderful new books on how to think about the need, basis, and validity of statistical analysis of a problem. They do not teach statistical methodology; rather, they teach how to think about analyzing problems, and how statistics sometimes help and sometimes cow readers into thinking less perceptively than they might.

Stat-Spotting is a small, easy book that shows us how to use ordinary life experience to spot questionable numbers. It then uses medically interesting examples to progress to the recognition of incorrect interpretations of valid statistical data. “Every statistic is the product of a series of choices made by the people who produce, process, and report the data.”[10] Biased sampling, misleading presentation of information, and the confusing use of esoteric measures are discussed using medical examples. The author, whose earlier Damned Lies and Statistics was highly successful, has produced a meaningful book on an important topic. He uses words, not mathematics, to transmit his ideas.

Know Your Chances. Understanding Health Statistics is clearly written by three internists teaching at Dartmouth and working in the Veterans Administration system. Using solely medical examples, they have four easily understood and useful sections in their book: What is My Risk, Can I Reduce My Risk, Does Risk Reduction Have Downsides, and Developing a Healthy Skepticism. Their multiple examples all involve topical issues in clinical medicine and in medical advertising. Only the simplest mathematics is in use. The book makes good, relaxing reading and is always interesting and relevant to clinical practice.

Chances Are is different from the other two books. It is larger, uses some complex mathematics, and has few medical examples, although there is a chapter titled “Healing.” It is a quite interesting book because it takes a historical and philosophical approach to show how various statistical concepts originally came into being. This is immediately clear at the outset when the authors open by pointing out that what we now call chance was once termed destiny and attributed to the gods. This may be the preferable book for those with a serious interest in the history of ideas, with confidence in their ability to follow mathematical equations, and with time on their sides. The examples from the gambling chapter are fascinating, though not directly relevant to problems in medical care. The Healing chapter points out, “Medicine is a profession long held in honor because it averts and is always interesting and

Any one of these three volumes might be enjoyed by our readers.

References
**CME Evaluation Program**

Physicians may earn up to 4 AMA PRA Category 1 credits for reading and analyzing the four designated CME articles, by selecting the most appropriate answer to the questions below, and by successfully completing the evaluation form. Other clinicians for whom CME is acceptable in meeting educational requirements may report up to four hours of attendance. Please return (fax or mail to the address listed on the back of this form) to *The Permanente Journal* by **September 15, 2009**. Forms may also be completed and submitted online at: www.kp.org/permanentejournal. You must complete all sections to receive credit. (Completed forms will be accepted until September 2010. Acknowledgment will be mailed within two months after receipt of form.)

**Section A.**

### Article 1. (page 25)
**Reducing Newborn Office Visits and Improving Satisfaction through Parent Education and Learning Communities**

**All of the following were among the most common subjects of questions during the conference calls except:**
- a. colic and gassiness
- b. sleeping schedules and sleep practices
- c. circumcision care
- d. umbilical cord care

**All of the following are true statements about the results of the study except:**
- a. newborn classes and follow-up conference calls improved patient satisfaction
- b. unnecessary visits were reduced more among those parents that attended both the classes and the calls vs those that attended classes alone
- c. there was a slight reduction in the volume of calls to the call center from the parents in the intervention group
- d. attending more than one conference call had no effect on the number of unnecessary visits

### Article 2. (page 19)
**Use of a Computerized Medical Database and Reminder Letters to Increase Preventive Care Use in Kaiser Permanente Patients**

**Which statement about the Panel Management Support Tool is incorrect?**
- a. it is a useful tool for generating patient outreach attempts such as reminder letters or phone calls
- b. it can always reduce necessary time spent with patients
- c. it allows easy access to information about preventive care measure both at an individual and at a population level
- d. it is relatively easy to use

**Which statement about outreach letters is incorrect?**
- a. they can increase preventive health care utilization by patients
- b. they might improve future medical care for low-utilizing patients
- c. they can reach a response rate of over 50%
- d. they can address multiple preventive care deficiencies

---

The Kaiser Permanente National Continuing Medical Education Program (KPNCMEP) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. The KPNCMEP designates this educational activity for 4 AMA PRA Category 1 credits. Each physician should claim only those hours of credit that s/he actually spent in the educational activity. All editors, reviewers, and authors have no conflicts of interest to disclose; where any possible conflict is indicated, it has been reviewed and found not to have any impact on the article content.

*The Permanente Journal* has been reviewed and is acceptable for up to 8 Prescribed credits by the American Academy of Family Physicians. AAFP accreditation begins 01/01/09. Term of approval is for one year from this date. This issue is approved for 2 Prescribed credits. Credit may be claimed for one year from the date of this issue.
### Article 3. (page 38)
**Laparoscopic Repair of Incisional and Other Complex Abdominal Wall Hernia**

In laparoscopic ventral hernia repair, what is the minimum amount of mesh overlap beyond all fascial edges that should be obtained?

- a. 1 cm
- b. 2 cm
- c. 3 cm
- d. 4 cm

Based on a large published series, what is the reported recurrence rate for an initial laparoscopic ventral hernia repair at one year?

- a. 5%
- b. 10%
- c. 15%
- d. 30%

### Article 4. (page 48)
**Acute Phosphate Nephropathy**

Which of the following is NOT a risk factor for the development of acute phosphate nephropathy (APN)?

- a. age greater than 55
- b. underlying chronic kidney disease
- c. male gender
- d. volume depletion

Which of the following medications does not potentially increase risk of APN?

- a. lisinopril
- b. amlodipine
- c. furosemide
- d. ibuprofen

---

### 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 caregiving 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 the stated objectives, please choose your level of agreement next to each statement as appropriate.

<table>
<thead>
<tr>
<th>Article</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The article covered the stated objectives.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I learned something new that was important.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I plan to use this information as appropriate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I plan to seek more information on this topic.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I understood what the author was trying to say.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

____________________________________________
____________________________________________
____________________________________________
____________________________________________
____________________________________________

---

### Section D. (Please print)

- **Name**
- **Title**
- **NUID #**
- **E-mail**
- **Address**
- **Signature**
- **Date**