Comparisons of Health Education, Group Medical Care, and Collaborative Health Care for Controlling Diabetes

Risk of Proximal Colonic Neoplasms in Asymptomatic Adults Older Than 50 Years Found to Have Distal Hyperplastic Polyps on Routine Colorectal Cancer Screening

Primary Care DirectConnect: How the Marriage of Call Center Technology and the EMR Brought Dramatic Results—A Service Quality Improvement Study

The Limits of Tolerance: Convicted Alcohol-Impaired Drivers Share Experiences Driving Under the Influence

Conflicts of Interest in Research—Towards a Greater Transparency

Clostridium difficile Infections: What Every Clinician Should Know

Late-Presenting Complications After Splenic Trauma

Echinococcus of the Liver Treated with Laparoscopic Hepatectomy

Humanizing Patients through Narrative Approaches: The Case of Murphy, the “Motor-Mouth”

Pressure Ulcers: What Clinicians Need to Know

Hyponatremia—What Is Cerebral Salt Wasting?
**Circulation:** 25,000 print readers per quarter, and accessed by 519,000 unique Web readers in 2009 from 164 countries.

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**ORIGINAL RESEARCH & CONTRIBUTIONS**

1. Comparison of Health Education, Group Medical Care, and Collaborative Health Care for Controlling Diabetes.
   
   Lewis Mehl-Madatus, MD, PhD, MPH

   This early phase clinical assessment focuses on improving outpatient care for Native Americans with diabetes mellitus through "shared collaborative care"—simultaneous medical, psychological, and spiritual care, compared to diabetes education, or group medical care. All of the multiple measures of glucose control were statistically significantly better for shared, collaborative care. Potential explanations offered include stress reduction, increased social support, producing more positive health beliefs, and acting as a naturalistic biofeedback.

2. Risk of Proximal Colonic Neoplasms in Asymptomatic Adults Older Than 50 Years Found to Have Distal Hyperplastic Polyps on Routine Colonoscopy Screening.
   
   Bradley D Collins, MD, MHS, FACC

   A retrospective case-control study of medical charts and colonoscopy reports compiled during a ten-year period found that distal hyperplastic polyps (HP) in the lower Vs of colon were not significantly associated with synchronous proximal neoplasms when patients with HPs were compared with those without any distal polyps at all (odds ratio = 0.94; interval = 0.73-1.22).

3. Primary Care DirectConnect: How the Marriage of Call Center Technology and the EMR Brought Dramatic Results—A Service Quality Improvement Study.
   
   Brett Bowman, MBA, Scott Smith, MD

   DirectConnect is a system that automatically routes medical advice calls directly to the Primary Care Physician (PCP) or staff to manage their panel's requests in real time with "one-number" convenience. DirectConnect resulted in statistically significant improvement in patient satisfaction percentage of all Primary Care calls handled by the lone medical office team, the centralized Call Center speed of answering calls, and estimated savings of cumulative hours per week in unnecessary telephone work redesigns.

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**BOOK REVIEWS**

- **Fibromyalgia**
  
  By RH H MacCarberg and Daniel J Llaus

  ISBN-10: 1402886790
  New York: Informa Healthcare; 2006
  Hardcover: 176 pages $150.00

- **Obese from the Heart: A Fat Psychiatrist Discloses**
  
  By Sara L Stain, MD

  ISBN-10: 0825253481
  Cleveland, OH: Quantum Psych INC; 2006
  Paperback: 144 pages $11.95

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**On the Cover**

"Yosemite Falls, Yosemite National Park, California." It is a photograph by Richard Gaskill. With a drop of 2425 feet, Yosemite is the tallest waterfall in North America. It has an upper fall, a lower fall, and a middle cascade that flows in a chasm between the two.

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**Books published by Permanente authors:**

- **The Limits of Tolerance: Convicted Alcohol-Impaired Drivers Share Experiences Driving Under the Influence.**
  
  Christine E Whitten, MD

  ISBN-10: 0928694188
  San Diego, CA: Monograph Publications; 1997
  Paperback: 240 pages $19.99

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CASE STUDIES

41 Late-Presenting Complications After Splenic Trauma. 
Sandra Freiwald, MD, FACS

The management of blunt splenic trauma has evolved from almost exclusive surgical management to selective nonsurgical management in hemodynamically stable patients. Understanding the spleen's immunologic importance in protection against overwhelming postsplenectomy infection led to surgical splenic salvage and later to nonsurgical management (60% of adults). This article describes a pancreatic pseudocyst, a delayed complication of nonsurgical management.

45 Echinococcus of the Liver Treated with Laparoscopic Hepatectomy. 
Erina N Foster, MD; Caleb Hertz, MD

Echinococcosis or hydatid disease is endemic to many countries where livestock, mainly sheep and cattle, are raised. Dogs that act as the definitive hosts for the adult phase of the echinococcal tapeworm. We report a case of a man, age 22 years, who emigrated from Kyrgyzstan as an adult, presenting with abdominal fullness and nausea. A 9 cm echinococcal cyst of the liver was successfully treated with laparoscopic hepatectomy.

47 Humanizing Patients through Narrative Approaches: The Case of Murphy, the “Motor-Mouth.”
Michael Pickren Valenti, MA; Lewis Mehl-Madrona, MD; PhD, MPhil

Some psychiatric patients are presented as hopeless, burned out, and devoid of social graces. A narrative perspective allows anyone to emerge as a richly complex human being. Murphy in story emerges as a more interesting, worthy of knowing, and richly complex human being than the clinical Murphy constructed by medical staff. This approach fosters a more therapeutic and effective relationship between patients and staff.

CLINICAL MEDICINE

53 ECG Diagnosis: Wolff-Parkinson-White Syndrome. 
Joel T Levis, MD, FACEP, FAAEM

Wolff-Parkinson-White Syndrome—the presence of an accessory pathway and a predisposition to the development of supraventricular tachydysrhythmias—results in conduction that circumvents the atrioventricular node, leading to early eccentric activation of the ventricles and fusion complexes. Unstable patients should receive immediate electrical cardioversion. Stable patients can be chemically cardioverted with IV procainamide.

54 Image Diagnosis: Ankle Fractures and Dislocations. 
Sundeep R Bhat, MD; Gus M Carmel, MD, FACEP, FAAEM

Standard radiographs for suspected ankle injury include anterior-posterior, lateral, and mortise views. This series features: a subtle fracture of the distal fibula; a bimalleolar ankle fracture, a trimalleolar ankle fracture, and a talar neck fracture-dislocation.

56 Pressure Ulcers: What Clinicians Need to Know. 
William T Wake, MD, FAAFP

Pressure ulcer treatment is one of many aspects of patient care in which nursing care interfaces directly with clinician-provided medical services. Although traditionally the treatment of pressure ulcers has been left to nurses, physicians have become more engaged in the prevention, identification, and treatment of pressure ulcers. Patients who are ambulatory can also develop pressure ulcers.

62 Hyponatremia—What Is Cerebral Salt Wasting? 
Jasminder Momi, MD; Christopher M Tang, MD; Antoine C Abcar, MD; Dean A Kujubu, MD; John J Sim, MD

Hyponatremia, a common electrolyte imbalance in hospitalized patients, is associated with significant morbidity and mortality, if the underlying cause is incorrectly diagnosed. The hospitalist is faced with a clinical dilemma when there is hyponatremia of unclear etiology and uncertain volume status. The syndrome of inappropriate antidiuretic hormone is frequently diagnosed in this clinical setting, but cerebral salt wasting is an important diagnosis to consider.

SOUL OF THE HEALER

OriginalVisual Art
17 “Hibiscus”
Ira J Levy, MD

25 “The Medusa of Alcoholism”
Lorenzo Mills, MD

52 “Evening in the foothills”
Gary Larsen, MS

61 “Mendocino”
Nandini Bakshi, MD

Original Literary Art
51 Mammogram. 
Teri Bordenave, MHSA

76 Chocolates. 
Lynette Vialet, MD

Book Reviews
page 77
Comparisons of Health Education, Group Medical Care, and Collaborative Health Care for Controlling Diabetes

Lewis Mehl-Madrona, MD, PhD, MPhil

Abstract
Introduction: This article presents early-phase clinical investigations into how to care for people with diabetes mellitus (DM) in an outpatient setting, focusing on efforts at improving care for Native Americans using conventional and nonconventional interventions—in particular, whether engaging people with DM using culturally specific and spiritual methods were more effective in reaching several DM management goals than conventional methods alone. This outreach may be seen as an example of delivering culturally competent medical care, a prime objective of family medicine.

Methods: In a three-year, serial process, three interventions included: diabetic health education, group medical care for diabetes, and shared collaborative care, which included medical, psychological, and spiritual care provided simultaneously.

Results: In all clinical outcome data—multiple measures of glucose control—statistically significant differences were found between shared, collaborative care and group medical care, and also between these and standard health education and conventional care.

Discussion: Several potential explanations are offered, with discussion, for how shared, collaborative care can be more helpful than group care or individualized care alone, including: stress reduction, increased social support, producing more positive health beliefs, and acting as a kind of naturalistic biofeedback.

Introduction
This article presents some early-phase clinical investigations into how to care for people with diabetes mellitus (DM) in an outpatient setting, focusing on my efforts at improving care for Native Americans using conventional and nonconventional interventions. In particular, I examined whether efforts at engaging people with DM using culturally specific and spiritual methods were more effective in reaching several DM management goals than conventional methods alone. This outreach may be seen as an example of delivering culturally competent medical care, a prime objective of family medicine.

DM is a major health problem that is exploding in pandemic proportions. Certain ethnic or cultural groups have a particularly high prevalence of DM. The Pima (a South Central Arizona tribe), who have a prevalence of type 2 DM of >60%, are an example of this. As more than half of my practice consists of people of Native American ancestry, I wished to improve my efficacy in helping people control their DM.

The incidence and prevalence of DM are rising in much of the world. Health inequalities in developed countries may explain some of that rise. Increasing insecurity regarding housing, income, and food may correlate with increasing prevalence of type 2 DM. For this reason, purely medical approaches to DM or even educational approaches may not be as successful as approaches that simultaneously address medical, psychological, and spiritual aspects of life with DM. This is all the more relevant because stress can stimulate hyperglycemia. Among adults with type 2 DM using daily stress diaries, blood glucose levels tended to be higher on high-stress days and lower on low-stress days, suggesting that stress does have a hyperglycemic effect in the natural environment, a finding paralleling the commonsense assessment of many clinicians. A study in Zagreb failed to demonstrate an association between the stress of displacement during the first eight months of the armed conflict in Croatia and metabolic control.
Comparisons of Health Education, Group Medical Care, and Collaborative Health Care for Controlling Diabetes

of patients with DM.\textsuperscript{31} Coping styles and other covariates, however, were not considered in this assessment, so how we cope with the challenges of our lives may be more important than what those challenges are. At 12-year follow-up evaluations, brittle DM almost always relates to a situation-specific stress, usually unhappiness at home or school. Blood glucose level tends to improve once the underlying stressful life circumstance changes or improves. When the underlying life event does not change and unhappiness continues unabated, the medical prognosis is poor.\textsuperscript{32} Longer clinical visits are also needed for people to become able to communicate about their difficult situations and to even conceptualize that life could change.

An approach to care that combines medical, psychological, and spiritual care to generate stories for behavior and lifestyle change could be very helpful for people with DM because these factors interact and overlap. If participants with DM can learn better means for managing stress and negotiating their lives, measures of DM control may improve. Typically patients have stories to explain or justify unhealthy behaviors, and eliciting these stories often requires longer contact time than the usual medical office visit. Without changing these stories, health behavior rarely changes.

Group care long has been used as a means of affecting the symptoms of medical conditions in situations as diverse as asthma, DM, and cancer.\textsuperscript{15} Community interventions that encompass a wide range of activities in a variety of settings offer greater potential for promoting lifestyle change.\textsuperscript{5,14,15} Exchanges of community resources that tap into local educational, medical, social, and lay expertise to address DM may take different forms, be they formal or informal, unidirectional or multidirectional. Collaborative partnerships between community entities are coherent with an ecologic perspective that stipulates a multilevel, multidisciplinary approach to health promotion.\textsuperscript{16}

Methods

This pilot project aimed to explore three models for providing care to patients with DM. The models were introduced into my practice sequentially. The logic behind the sequence consisted of a search for the most effective way to improve measures of control, with awareness of the limitations of the approach being used at the time and an improvement. A high proportion of my clientele consisted of Native Americans. First, I tried introducing diabetic health education for one year. Then I tried group medical care for DM for one year. Third, I implemented shared collaborative care, which included medical, psychological, and spiritual care provided simultaneously. The rationale was to improve DM control. Each intervention suggested its successor in a continued attempt to maximize effectiveness. Unfunded, community-based research in actual practice settings like that which I am presenting may have advantages over the randomized, clinical trials conducted in academic medical centers, because these settings more closely resemble the venues in which most physicians practice. The patients presented here may be more representative of those encountered by community physicians than those in academic centers. We may also learn much that can guide clinical trials.

Patient Selection

No exclusions of any person with type 2 DM were made, as this was a clinical pilot study in a community-based setting. Participants were referred by me, a nurse practitioner, a community-health nurse, or by others in the community.

Initial Patient Assessment

Participants underwent the following procedures:

- **Medical history and physical examination**
- **Timeline health history**, including family medical history, social history, and treatment checklist form. The timeline health history obtains dynamic data on perceived quality of life and behavior over the past two years. It measures patient perception of anxiety, self-esteem, cigarette smoking, drug use, alcohol use, quality of diet, work stress, perception of general health, personal stress, family support, support of friends and community, relationship quality, levels of depression, activity levels, and exercise levels. Diet was assessed with a 24-hour diet recall to obtain information on nutritional status. We used the Food Processor II software (version 3.0, ESHA Research, Salem, OR, USA) to determine nutritional intake.
- **Laboratory studies**, including glycated hemoglobin (HbA\textsubscript{1c}), lipid profile, complete blood count, urinalysis, and basic chemistry panel.

Health Education

Standard American diabetes education was provided in addition to conventional medical care. I employed a diabetes health educator to provide these classes.
Group Medical Care

For group medical care, participants came at the same time and had their medical care visit together as a group. This visit included discussion of symptoms and concerns, adjustment of medication, weights and measurement, and health education. When anyone needed an examination that required privacy, this was conducted individually after the end of the group visit. I provided these services and offered all of my patients with type 2 DM the opportunity to come on the same day at the same time and create a community around DM.

Shared Care Intervention

For shared care intervention, participants came at noon for a meal. I worked with a traditional spiritual elder for the period from noon to 3 or 4 pm. We focused on the nutritional, the medical, the psychological, and the spiritual. The group began with group medical care, as in the first format, followed by a problem-solving group and then by specific targeted interventions. Being both a family physician and a psychologist, I had both skills sets and so provided care in both formats. Specific interventions included a talking circle, practice in recognizing stress, focus on increasing social networks, practice of relaxation and meditation skills, journaling, focus on improved coping skills, information on alternatives for cravings, telling our stories, using guided imagery, recognizing health beliefs, social skills training, and visualization to improve self-esteem. Education exercises concerned physical activity, dietary modification toward a traditional Native American diet, and building social networks.

I obtained the standard laboratory tests at the standard intervals recommended by the American Diabetes Association whenever possible. I report these results here. I also kept track of the stories told in our meetings and of my experience of participating (reflective methodology and intuitive inquiry). It occurred to me that the best interventions would engage participants and leaders maximally and would be fun.

Results

Table 1 presents the characteristics of the patients attending my optional additional care sessions during the three years of the study. The population for each intervention was not very different. Once patients had settled into an intervention, it was not changed when a new intervention was offered, unless they asked, which no one did.

Table 2 presents the results of my patients for their first six months of participating in each study condition. Clearly, standard of care plus health education in my practice setting was associated with slow deterioration. I wanted to understand this, so I sat in on several education sessions and found that they were uninteresting. My patients shared that nothing was happening, and most stopped going. Hiring a diabetes health educator did not appear to be very helpful.

Group Medical Care Versus Standard Health Care Plus Health Education

Group medical care was much more enjoyable than standard care plus health education. We (the nurses and I) looked forward every week to “diabetes afternoon.” We enjoyed the patients with DM so much more than we had when providing standard care. We could have spent up to four hours together with our patients with DM every week, though most people came less often than weekly and many came late or left early. In group care, I learned their stories. I learned about their families, their hopes and dreams, their fears. In addition to taking blood pressures, measuring glucose, and performing the other instrumental activities of medical care, we shared our lives. I enjoyed teaching them how to take blood pressures and how to check urine for sugar. The participants felt an increased sense of empowerment about their health care from the stories

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Table 1. Study sample characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Health education</th>
<th>Group medical care</th>
<th>Shared care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men/women (SD)</td>
<td>19/23</td>
<td>21/19</td>
<td>25/22</td>
</tr>
<tr>
<td>Age in years (SD)</td>
<td>45.4 (8.8)</td>
<td>50.9 (6.5)</td>
<td>49.6 (7.8)</td>
</tr>
<tr>
<td>Income in thousands (SD)</td>
<td>14.6 (15.8)</td>
<td>17.12 (16.93)</td>
<td>15.86 (20.89)</td>
</tr>
<tr>
<td>Years of education (SD)</td>
<td>11.2 (3.7)</td>
<td>10.3 (4.0)</td>
<td>10.9 (2.6)</td>
</tr>
<tr>
<td>Years married (SD)</td>
<td>18.3 (9.1)</td>
<td>19.5 (13.7)</td>
<td>23.6 (9.4)</td>
</tr>
<tr>
<td>Percentage Native American</td>
<td>80</td>
<td>78</td>
<td>72</td>
</tr>
<tr>
<td>Years of illness (SD)</td>
<td>6.75 (4.01)</td>
<td>6.54 (4.86)</td>
<td>6.23 (3.45)</td>
</tr>
<tr>
<td>Medication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>8</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Oral</td>
<td>40</td>
<td>32</td>
<td>35</td>
</tr>
<tr>
<td>Insulin</td>
<td>9</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Physical measures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbA1c (SD)</td>
<td>7.08 (1.2)</td>
<td>7.05 (0.98)</td>
<td>7.20 (0.99)</td>
</tr>
<tr>
<td>BMI (SD)</td>
<td>30.72 (4.89)</td>
<td>30.33 (4.27)</td>
<td>30.60 (4.57)</td>
</tr>
</tbody>
</table>

Note: Data are means and standard deviations (in parentheses) unless otherwise specified.

HbA1c = glycated hemoglobin, a measure of glycemic control over a three-month period. American Diabetes Association criteria for adequate clinical control is <7.

BMI = body mass index, an indirect index of adiposity in adults. Scores from 18.5 through 24.9 indicate normal weight for adults, according to National Heart, Lung, and Blood Institute clinical guidelines.

SD = Standard deviation
Comparisons of Health Education, Group Medical Care, and Collaborative Health Care for Controlling Diabetes

related to me. They enjoyed the sense of camaraderie and fun that group care provided. Sometimes family members would come and participate in group care; all were welcome.

Health education was primarily a one-way street. Participants were taught facts about DM and told how to manage their DM. Their participation consisted of asking questions that were answered by the educator. No new stories emerged. The stories presented were those of conventional DM care.

In group medical care, more interesting stories emerged. Patients had time to talk about their lives and difficulties with DM. We were able to see emergent themes of the stories being told by group members, including how to approach common problems shared by participants. These common issues included how to exercise; whether to exercise; what to eat; when to eat; how to cook; how to manage stress; and life issues, such as money problems, problems with children and parents, marital problems, sexual problems, and work problems. Group care gave time for discussion.

Shared, collaborative care was most effective (Table 2) and was also the most enjoyable. All present enjoyed the shared meal. We learned about traditional Native American foods, how to cook them, and how good they could taste. Sharing care with the elder (Nick) provided an added dimension of richness and spirituality. Prayer entered into our deliberations, along with the occasional ceremony. Additional discussions focused on what constituted “Indianness” and how to cultivate it. The elder added the perspective of traditional stories, traditional foods and activities, and cultural identification.

What differed about group care and shared care from conventional health education was the lack of much specific discussion about facts and DM. Mostly we shared our lives and what mattered to participants. We brainstormed about how to help each other. We talked about how to live a lifestyle more like our ancestors. The spirit was collaborative and supportive. In this sense it was culturally sensitive to Native American patients (I am also Native American).

**Patient Narratives**

“I found out I had diabetes ten years ago, and I don’t know how long I had it before that. I was having dizzy spells. I went in and saw the doctor and found out I had it. He gave me medicine and [a] program, but it was hard to follow what he told me to do. I didn’t have anyone to walk with and I just didn’t feel like walking alone. When I tested my sugar, it was usually high. When I started coming here and spending time with the doctor and Nick [the traditional healer], I took my sugar three times a day and started walking. It slowly came down. I knew it was working. Sometimes some of the guys who come here also walk with me. Now my sugar is usually okay. I also take some of those medicines that the traditional healer brings. He gave me some rat root, which be said is good for diabetes. We pray together too, and that sure helps. I take some arthritis medicine from the healer too. I don’t need a knee replacement. He smudges me and doctors my knee, and that really helps also. I respect traditional medicine. I’m glad you got Nick to come over. My wife takes traditional medicine for arthritis and for her sugar too. Her sugar is stable too. Sometimes it gets too low if she doesn’t eat.”

**Table 2. Changes in measures of glucose control**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Health education</th>
<th>Group medical care</th>
<th>Shared care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycated hemoglobin (HbA1c), value percentage points</td>
<td>0.6</td>
<td>-0.4</td>
<td>-2.1</td>
</tr>
<tr>
<td>Mean fasting blood glucose level, mg/dL</td>
<td>0.4</td>
<td>-28.3</td>
<td>-42.8</td>
</tr>
<tr>
<td>Systolic blood pressure, mmHg change</td>
<td>1.5</td>
<td>-9.0</td>
<td>-13.5</td>
</tr>
<tr>
<td>Diastolic blood pressure, mmHg change</td>
<td>1.7</td>
<td>-3.4</td>
<td>-5.1</td>
</tr>
<tr>
<td>Weight, kg change</td>
<td>0.3</td>
<td>-1.2</td>
<td>-2.4</td>
</tr>
<tr>
<td>Low-density lipoprotein level, mg/dL change</td>
<td>8.1</td>
<td>-16.2</td>
<td>-24.3</td>
</tr>
<tr>
<td>High-density lipoprotein level, mg/dL change</td>
<td>-1.3</td>
<td>2.6</td>
<td>3.9</td>
</tr>
<tr>
<td>Serum triglyceride levels, mg/dL change</td>
<td>11.2</td>
<td>-22.4</td>
<td>-33.6</td>
</tr>
<tr>
<td>Arizona Integrated Outcome Score change</td>
<td>0.00</td>
<td>0.7</td>
<td>1.05</td>
</tr>
</tbody>
</table>

All measures of group medical care and shared care are statistically significantly different from health education at p < 0.05 or better, and all measures between group medical care and shared care are also significant at p < 0.05 or better.
An important distinction now being made in stress research is between life events that can potentially be stressful and the levels of stress actually perceived by the person experiencing the stress.

**Discussion**

Clinical outcome data showed the greatest benefit coming from shared, collaborative care, followed by group medical care, followed by standard health education and conventional care. A MedLine search revealed no other studies combining nutritional, medical, psychological, and spiritual care for Native Americans with DM. The collaborative intervention also allowed for more culturally competent care in that it was easy to integrate the traditional elder into the medical and psychological care in a way that patients appreciated.

Time-wise, I usually spent 15 minutes on an individual appointment with a patient who had DM, plus the cost of a diabetes health educator. Group care improved on that by including more than eight people every other week for two hours. Shared care was more popular with patients and me. Shared care did not improve on the efficiency of group care, but more people came each time it was offered. Plus, I found it stress-reducing and very enjoyable. To equal standardized care, I needed 12 people to come to each session. Invariably there were more. Normally I would have been alone during my lunch hour. In this format, I ate amazing food with a group of people about whom I cared.

Both group care and collaborative care could be classified as encompassing social science interventions to enhance the effectiveness of medical practice. Cousins exist to our collaborative care and/or group care interventions including Nofsinger’s drop-in group medical appointments (DIGMAs). He showed that the use of DIGMAs substantially leveraged physician time, improved accessibility at both the individual physician and the departmental levels, increased quality of care by better addressing patients’ mind-body needs and improving follow-up care, achieved high levels of patient and physician satisfaction, and reduced costs to the organization by leveraging existing staffing resources:

**DIGMAs enable physicians to see dramatically more patients in the same amount of time but in a way that increases patients’ satisfaction with their health care and physicians’ professional satisfaction while improving service and quality of care. DIGMAs offer an extended medical appointment with the patient’s own doctor in a group visit setting that enhances the patient’s care experience.**

The increased efficiency that DIGMAs provide can be used both to enable physicians to better manage their large practices and to improve the customer focus of the organization. Although still quite new, the DIGMA concept is already beginning to gain attention and recognition.

Questions arise as to how shared, collaborative care can be more helpful than group care or individualized care alone. One of several potential explanations includes stress reduction. The occurrence of recent, potentially stressful life events was associated with worsened DM control. Collaborative medical care could help reduce the impact of stressful events more than group medical care or DM health education. An important distinction now being made in stress research is between life events that can potentially be stressful and the levels of stress actually perceived by the person experiencing the stress. In one study of patients with insulin-dependent DM between the ages of 16 and 65 years, higher levels of perceived stress (but not daily hassles) were associated with poorer diabetic control. Emotional stress (a concept similar to perceived stress) has also been linked to poor DM control.

Collaborative care could also increase social support. Decreases in social support predicted a worsening of longer-term (HgA1c) DM control over time. Patients who perceived they had more social support experienced better control of their DM. Other fac-
Comparisons of Health Education, Group Medical Care, and Collaborative Health Care for Controlling Diabetes

The variables important were associated with better metabolic control. Perhaps a positive attitude produces less anxiety and stress on glycemic control in patients with type II diabetes. Others have observed that there is often a lack of agreement between compliance and diabetes control. Clinicians who work with patients with DM have seen those who fail to achieve control despite dedicated compliance with therapeutic regimens. Harris and Linn’s study participants were mostly middle-aged, obese men, all of whom had had DM for nearly ten years. They were not very compliant. Even in the face of noncompliance, these men averaged monthly visits to the outpatient clinic and had relatively positive health beliefs. Harris and Linn found that the men’s health beliefs had a positive impact on control separate from compliance. They noted that the intervening variable between beliefs and control is usually assumed to be behavior (compliance). Instead, it appeared that the attitudes that treatment could help, that symptoms called for treatment, that susceptibility to diabetic complications was low, and that family support was considered important. Collaborative care was perhaps more able to manage these less specific factors that are affecting DM.

Collaborative care may provide a kind of naturalistic biofeedback. Case studies have been reported in which biofeedback-assisted relaxation techniques have been used to improve glycemic control. One young woman with a ten-year history of insulin-dependent DM was helped to achieve better control through improved stress management. Another case report described a female patient with unstable type I DM whose average blood glucose levels improved significantly and were maintained by the one-year follow-up evaluation with a constant or slightly decreased insulin dose.

Certainly, the richest stories in my study emerged in shared care. The time commitment for all three groups was about the same, but in standard care, participants went to medical care separately from health education and had to seek spiritual care and psychological care on their own. This separation of services made people less likely to use all potential services. Group medical care enriched the dialogue and combined education and medical services with some additional psychological services. Shared care provided the greatest integration. On the surface, shared care appeared to be the most time intensive because all services occurred in the same setting.

I offer this as an invitation to other physicians to venture outside of the usual ways that we provide care and to consider that other approaches may be more health effective—and may also be soul-saving for the physician. Many of us have lost sight of the joy of human interaction. Shared care and group care restored that for me.

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
Risk of Proximal Colonic Neoplasms in Asymptomatic Adults Older Than 50 Years Found to Have Distal Hyperplastic Polyps on Routine Colorectal Cancer Screening

Bradley D Collins, PhD, MHS, PA-C

Abstract

Purpose: A retrospective case-control study was conducted to evaluate whether hyperplastic polyps (HPs) found in the lower 50 cm of colon could be used as indicators for synchronous proximal neoplasms (SPNs) in the large intestine. Additionally, other characteristics considered included age; sex; ethnicity; history of cancer, cholecystectomy, or appendectomy; current use of aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs); current use of estrogen or hormone replacement therapy (HRT) in women; current smoking status; and the size, number, and location of the distal HP if present.

Methods: Convenience sampling of medical charts and colonoscopy reports compiled during a ten-year period was used to glean the sample of 1792 participants.

Results: Distal HPs in the lower 50 cm of colon were not significantly associated with SPN when patients with HPs were compared with those without any distal polyps at all (odds ratio [OR] = 0.94; 95% confidence interval [CI] = 0.73–1.22). However, significant relationships with proximal neoplasms (adenomas, advanced adenomas, and colon cancer) were noted in patients with a prior diagnosis of cancer (OR = 1.62; 95% CI =1.25–2.11), advancing age (OR = 1.02; 95% CI = 1.01–1.03), non-Caucasian (men only) ethnicity (OR = 0.72; 95% CI = 0.55–0.96), a history (men only) of taking aspirin or NSAIDs (OR = 0.73; 95% CI = 0.56–0.95), and a history (women only) of taking estrogen or receiving HRT (OR = 1.51; 95% CI = 1.04–2.20).

Conclusion: Routinely recommending a colonoscopy for every patient with distal HPs found only by screening flexible sigmoidoscopy is neither justified nor necessary. Nevertheless, further investigation (ie, colonoscopy) may be warranted in the aforementioned subgroups.

Introduction

Although in the US colorectal cancer (CRC) remains the third most common type of cancer and the second leading cause of cancer death overall, it is one of the few malignancies for which effective secondary prevention methods are applicable and obtainable. Regrettably, CRC was diagnosed in more than 150,000 people in 2009 and 56,000 died because of it.1 Furthermore, according to the World Health Organization (WHO), this disease resulted in an additional 655,000 deaths globally. Adenocarcinoma is by far the most prevalent type of CRC, accounting for nearly 95% of all cases, and 95% of all adenocarcinomas arise from specific growths called adenomatous polyps. As such, the array of contemporary screening methods now used for CRC prevention center on being able to successfully recognize and remove these precancerous neoplasms (adenomatous polyps) before they develop into cancer. Presently, there are five advocated options for elective screening in asymptomatic patients: 1) yearly stool testing for occult blood starting at age 50, 2) an air-contrast barium enema of the large bowel at age 50 and every five years thereafter if the findings are normal, 3) flexible sigmoidoscopy (FS) at age 50 and every five years thereafter if the findings are normal, 4) computed tomography colonography at age 50 and every five years thereafter if the findings are normal, and 5) colonoscopy at age 50 and every ten years thereafter if the findings are normal.23

The main focus of this analysis revolved around the use of FS within this asymptomatic screening population, and specifically, whether further evaluation (colonoscopy) should be considered in patients found to have distal hyperplastic polyps.
... many physicians and clinicians currently do not order any additional testing when HPs are the only significant finding on an FS.

...
Roughly 17% (307 patients) of the total sample was found to have distal HPs. There were somewhat more men (55.9%) than women (44.1%) in the total sample. Current cigarette use was noted for 12.9% of the sample (231 patients), and the current usage of aspirin or NSAIDs was 57.0% (664 patients). Of the 791 women in the sample, 17.7% (140 patients) were taking estrogen or undergoing HRT. Regarding prior medical conditions and procedures, 9.6% of the total sample (172 patients) had had a cholecystectomy, 13.3% (238 patients) had had an appendectomy, and 17.0% (305 patients) had had a previous diagnosis of cancer other than CRC. For the type of cancer, the most frequent categories were skin (38.0%; 116 patients), prostate (21.6%; 66 patients), and breast (19.0%; 58 patients). For racial or ethnic background in the total sample, the most frequent categories were Caucasian (68.4%; 1226 patients), Hispanic (17.2%; 308 patients), and black (8.9%; 160 patients). Ages ranged from 50 to 89 years (mean = 61.76; SD = 8.84).

### Multivariate Analysis

Table 1 displays the logistic regression model predicting the presence of proximal neoplasms on the basis of the total sample (n = 1792). The nine-variable model was statistically significant ($\chi^2 (9, n = 1792) = 55.05; p = 0.001$) and the base classification rate was 50.0%. The overall final classification rate was 57.5%. Specifically, the model correctly classified 62.3% of the cases in which there were no proximal neoplasms and 52.8% of the cases in which there were proximal neoplasms. Inspection of the ORs showed that proximal neoplasms were more frequently present in: 1) men (OR = 0.72; p = 0.001; 95% CI = 0.59–0.88), 2) nonusers of aspirin or NSAIDs (OR = 0.77; p = 0.009; 95% CI = 0.65–0.94), 3) those with previous cancer (OR = 1.62; p = .001; 95% CI = 1.25–2.11), and 4) older patients (OR = 1.02; p = 0.001; 95% CI = 1.01–1.03).
Table 2 displays the logistic regression model predicting the presence of proximal neoplasms on the basis of the full female sample (n = 791). The nine-variable model was statistically significant ($\chi^2 [9, n = 791] = 24.54; p = 0.004$), and the base classification rate was 53.9%. The overall final classification rate was 59.2%. Specifically, the model correctly classified 75.6% of the cases in which there were no proximal neoplasms and 40.0% of the cases in which there were proximal neoplasms. Inspection of the ORs for sample of men only = (n = 791). The eight-variable model showed that proximal neoplasms were more frequently present in: 1) those taking estrogen or undergoing HRT (OR = 1.51; p = .03; 95% CI = 1.04–2.20), 2) those with previous cancer (OR = 1.77; p = 0.003; 95% CI = 1.22–2.57), and 3) older patients (OR = 1.02; p = .01; 95% CI = 1.00–1.04).

Table 3 displays the logistic regression model predicting the presence of proximal neoplasms on the basis of the full male sample (n = 1001). The eight-variable model was statistically significant ($\chi^2 [8, n = 1001] = 35.34; p = 0.001$), and the base classification rate was 53.0%. The overall final classification rate was 57.5%. Specifically, the model correctly classified 47.9% of the cases in which there were no proximal neoplasms and 66.1% of the cases in which there were proximal neoplasms. Inspection of the ORs for proximal neoplasms within the asymptomatic screening population (use of estrogen and a history of cancer other than CRC). Although it would have been both provocative and insightful to be able to compare and contrast the outcomes of this investigation with the outcomes of others mentioned in this article, this was not realistically feasible because of diverse study designs, inclusion and exclusion criteria, operational definitions for the distal colon, applications of multivariate and statistical techniques, sample sizes, baseline demographic characteristics, and control or reference groups. It was the intent of this inquiry to answer the posed research question, by using the specified sample and target population in mind, to mirror present clinical climates and situations.

Given that this investigation in essence dealt with a cohort of individuals who would otherwise not be advised to undertake a colonoscopy (those with distal HPs or no distal polyps found by screening FS), these findings are relevant to this group as well. Hence, it may be judicious to advocate a diagnostic colonoscopy procedure for patients meeting any of the subsequent criteria: 1) older than 65 years of age; 2) positive history of cancer, particularly kidney, lung, leukemia, lymphoma, testicular, or thyroid; 3) men who are Caucasian; 4) men who are not taking aspirin or NSAIDs; and 5) women who are actively taking estrogen or undergoing HRT. With this being said, it is important to remain aware that there was a large amount of unexplained variance in the specified regression models. Therefore, additional research in this arena is mandatory to clearly define these variables and to determine their potential impact on clinical practice.

Table 3. Prediction of proximal neoplasms for sample of men only (n = 1001)

<table>
<thead>
<tr>
<th>Variable</th>
<th>p value</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distal HP</td>
<td>0.93</td>
<td>1.02</td>
<td>0.73-1.41</td>
</tr>
<tr>
<td>Smoking</td>
<td>0.68</td>
<td>1.08</td>
<td>0.75-1.55</td>
</tr>
<tr>
<td>Use NSAIDs</td>
<td>0.02</td>
<td>0.73</td>
<td>0.56-0.95</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>0.16</td>
<td>1.62</td>
<td>0.83-3.13</td>
</tr>
<tr>
<td>Appendectomy</td>
<td>0.82</td>
<td>0.95</td>
<td>0.64-1.42</td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>0.02</td>
<td>0.72</td>
<td>0.55-0.96</td>
</tr>
<tr>
<td>Previous cancer</td>
<td>0.03</td>
<td>1.52</td>
<td>1.05-2.20</td>
</tr>
<tr>
<td>Age</td>
<td>0.005</td>
<td>1.02</td>
<td>1.01-1.04</td>
</tr>
</tbody>
</table>

* Coding: 0 = No; 1 = Yes
CI = confidence interval; NSAIDs = nonsteroidal anti-inflammatory drugs; OR = odds ratio

Discussion
Above all, the results of this study helped confirm and substantiate current practice guidelines pertaining to patients with distal HPs found on baseline CRC screening. Accordingly, recommending a colonoscopy for every patient with distal HPs found only by FS is not necessary. As depicted in Tables 1 through 3, distal HPs were not associated with an increased occurrence of SPNs (even when stratified by sex). In fact, of the 307 patients with distal HPs, the incidence of these growths was nearly identical for those with (50.2%) and for those without (49.8%) proximal neoplasms. This finding concurs with the conclusions and outcomes of other investigators who have also reported on this topic.2-7 In addition, this analysis demonstrated that there is a significant increase in odds of having a proximal neoplasm found on a routine screening examination if one is a Caucasian man, is a man not taking aspirin or NSAIDs, is of advancing age, has a history of cancer other than CRC, or is a woman actively taking estrogen. With the exception of the latter two variables, these factors too have been documented by other researchers to be associated with neoplasms in the large intestine.5,20 What was unique to this particular study was the identification of potentially two new risk factors...
Limitations

It must be emphasized that because a temporal association between an individual variable assessed in this investigation and the outcome of interest could not be firmly established, assertions concerning a direct cause-and-effect relationship could not be made. However, it should be noted that the results of a case-control study such as this can provide reasonable estimates that, when taken with other evidence, may support causal links between a specific risk factor and the presence or absence of disease.

Constraints also surround the overall generalizability and external validity of these findings, as convenience sampling was chosen to amass the respective sample. In this setting, the probability of selection was not readily known and the amount of sampling error could not be reasonably predicted. Thus, the ability to disseminate these findings beyond the sample studied is somewhat hindered; it cannot be assumed that the sample represents the target population.

Conceding this, the principle investigator made efforts to reduce the restraints placed on the data by this issue. Largely, this entailed making mindful and impartial sample selections in a manner that was void of influence from exposure histories and distal colonoscopy findings.

The only major threat to the internal validity of this undertaking identified was that of history. Fortunately, as dictated by the research design protocol, the rest of the main internal threats were not a dominant concern. Because this study incorporated medical charts and procedures dating back to 1997, it is plausible that the coercive effects of history could have affected some of the independent variables analyzed (current use of estrogen or HRT). Until late 2002, roughly seven million women in the US regularly took some form of estrogen or were receiving HRT, as these medications were heralded to be beneficial and protective. Yet after the landmark results from the highly publicized National Institutes of Health study of HRT describing the dangers of these products were made public in July 2002, the use of estrogen and HRT plummeted precipitously. Therefore, this event might have affected this variable (use of estrogen or HRT) in the women included from 2002 to 2007.

In conjunction with these limitations, it is also recognized that this retrospective inquiry was inherently and fundamentally predisposed to various forms of bias—namely, selection, misclassification, and observation. In response to this, safeguards were put into place. As alluded to earlier, the diffusion of selection bias centered on meticulously selecting the sample without prior knowledge of exposure histories or distal colonoscopy findings. Given the gravity of correctly classifying cases and controls, efforts to effectively manage misclassification took precedence. Case and control participants were operationally defined within the research protocol according to and abiding by set community standards (based on the WHO taxonomy for colonic polyps). To guarantee that there were no systematic differences in the way information was obtained from the study groups (observation bias), all data inspection, extraction, and documentation was done exclusively by the principle investigator.

Of note, other additional drawbacks of this protocol included not performing FS for all patients before the colonoscopy, not using one central pathologist to review the biopsy specimens, not requiring biopsies to be done by cold snare to ensure accurate tissue analysis, not recruiting from a variety of clinical settings, and not accumulating a larger and more ethnically diverse sample of patients with distal HPs.

Future Research

It is anticipated that FS will continue to be used as a viable screening modality for the prevention of CRC for years to come (both in the US and abroad), so ongoing investigation regarding this procedure seems prudent. Why did a history of cancer other than CRC increase the odds of having a proximal neoplasm in the asymptomatic screening population? Why did taking estrogen or HRT-related medications heighten the risk of proximal neoplasms in women? Why was current use of aspirin or NSAIDs protective against proximal lesions in men but not in women? Why did Caucasian men have a higher incidence of proximal growths? These are compelling questions that require future scientific inquiry.

Disclosure Statement

The author discloses that he is on the Advisory Board and Speaker Bureau for Three Rivers Pharmaceuticals.

Acknowledgment

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

References

Risk of Proximal Colonic Neoplasms in Asymptomatic Adults Older Than 50 Years Found to Have Distal Hyperplastic Polyps on Routine Colorectal Cancer Screening


11. Achkar E, Carey W. Small polyps


“Hibiscus”
photograph

By Ira J Levy, MD

Dr Levy is a retired physician of the Southern California Permanente Medical Group. He is the former Director of Emergency Services and former Director of Pulmonary Services at the West Los Angeles Medical Center and Clinical Professor Emeritus of Medicine at the University of Southern California School of Medicine in Los Angeles, CA.

This photograph is reminiscent of the Asian use of space in art which stimulated Dr Levy to produce it. Dr Levy has long been interested in this approach to this use of space.
Primary Care DirectConnect:
How the Marriage of Call Center Technology and the EMR Brought Dramatic Results—
A Service Quality Improvement Study

Brent Bowman, MBA
Scott Smith, MD

Abstract
Of the key Health Plan patient satisfaction measures used in Kaiser Permanente Colorado, ease of contacting the physician's office with a medical question was consistently rated as the lowest quarterly patient satisfaction measure. Furthermore, medical office staff had become dissatisfied with their inability to contact patients who had previously left messages. In addition to the sheer volume of messages, the return calls were often unanswered, leading to subsequent failures to reach patients, creating additional work for medical office staff.

DirectConnect—the project name for a system and set of processes focused on improving patient satisfaction with the ability to contact Primary Care delivery teams by telephone—focuses on isolating medical advice calls from the other types of calls handled by the centralized Call Center. The system identifies the patient using his/her unique electronic medical record number, then automatically routes medical advice calls directly to the appropriate Primary Care Physician (PCP) or staff. The clinician may then evaluate and respond to the patient’s need quickly, thus managing more of their panel's requests in real time.

How is DirectConnect different from simply having the patient contact their PCP's office directly? The primary difference is “one-number” convenience that allows all patients to dial one number to access their PCP's team. In addition, calls are routed to various staff as available to reduce long telephone queues and wait times.

The DirectConnect system has resulted in statistically significant improvement in key service quality measures. Patient satisfaction improved from a pre-implementation nine quarter mean of 55.9% to a post-implementation 12 quarter mean of 70.2%. Fourteen percent to 17% of all Primary Care calls are now handled by the patient's home medical office team, creating a 54% improvement in the centralized Call Center's speed of answering calls in the first quarter post implementation—making no additions to medical office staffing levels. The efficiencies gained by directly connecting medical advice-seeking patients with their Primary Care team resulted in an estimated savings of 198 and 247 cumulative hours per week in unnecessary telephone work for Call Center and medical office staff regionwide.

Introduction
Problem Definition
For the nine quarters prior to DirectConnect's implementation, on average only 55% of Kaiser Permanente Colorado (KPCO) patients rated the ability to contact their physician as “extremely easy” or “easy” with a range between 44% and 59% (Figure 1). This served as evidence of KPCO's “big system” feel when compared to its care delivery competitors. Patients routinely expressed their frustration with the process of leaving a message with someone they didn't know (Call Center agent) and awaiting a call back at some unpredictable time in the future. The following patient comments on the system of leaving telephone messages were documented in KPCO's QIII 2005 and QIV 2005 patient satisfaction study:

“It makes it more difficult to wait for them to call back. It might be sometime later in the day, so it's not convenient because you don't know when they could call you back.”
“It is just hard to give them a call back number if you don’t know where you are going to be and they can’t tell you exactly when [they will] call.”

“I would tell [KPCO] that they need to have a different way to actually contact a physician or triage nurse when needed, a lot easier than it is now.”

Before DirectConnect, patients with a medical question would call the regional Primary Care Call Center with the hope of speaking with someone from their home medical office. Instead, centralized Call Center agents, located away from all primary care medical office buildings were forced to use an electronic message to route questions to the appropriate medical office building. Patients then awaited a return call from their trusted Primary Care team. Although patients ultimately received the appropriate level of care, the process rarely met preferred service expectations.

Beyond the well-documented issues of poor patient satisfaction, the internal system of managing telephone messages was fraught with waste and rework—although the full extent of this waste and rework had not been formally quantified.

From the centralized Call Center perspective, inbound call volumes were projected to increase at a rate of 3% to 10% per year and the ability to increase staffing was not available. These challenges resulted in 64% of calls answered within 60 seconds for the year prior to implementation of DirectConnect with an average speed to answer calls of 101 seconds during that period. These statistics are evidence of less than desired telephone service for any need related to Primary Care, or for appointments or medical questions.

### Current State Measurement and Analysis

Process improvement expert W Edwards Deming, one of the fathers of Lean Manufacturing concepts noted: “Workers are responsible for only 15% of the

<table>
<thead>
<tr>
<th>Table 1. Primary team members and sponsors</th>
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<tr>
<td><strong>Team member/sponsor</strong></td>
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<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>Steve Haley, MD</td>
</tr>
<tr>
<td>Mark Ptaskiewicz, MD</td>
</tr>
<tr>
<td>Gray Houlton, MD</td>
</tr>
<tr>
<td>Barbara Grimm</td>
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<td>Ginny Mc Lain</td>
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<tr>
<td>Margo Jamieson</td>
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<td>Timothy Woodworth</td>
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<td>Irma Smith</td>
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<td>Jason Tacha</td>
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<td>Marilyn Heustis</td>
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<td>Matthew Taylor</td>
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<td>Todd Trautman</td>
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<td>Ronda Deichert</td>
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<td>Frank Fransifioli</td>
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<tr>
<td>Lucas Armijo</td>
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<td>Ed Eaton</td>
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problems, the system for the other 85%. The system is the responsibility of management. In keeping with this philosophy, a small team of management, frontline employee representatives, internal consultants, and analysts were identified to focus on improving the system of telephone message management and to develop the methods by which ongoing measurement of that workflow could be realized (Table 1).

Figure 2 depicts the high-level process flow yielded by the analysis of the telephone messaging system. Four to seven process steps were needed to highlight the vast majority of scenarios related to the telephone message system. Weekly volumes were tabulated to capture the average number of electronic messages routed to each medical office building from the Call Center, the average number of documented attempts made by the medical office staff to call the patient back, and any subsequent return calls into the Call Center for transfer to the medical office building because the patient was not available to receive the first call back. For every 100 electronic messages routed from Call Center to medical office staff, an average of 130 call attempts were made from medical office staff back to the patient and another 21 calls were made from the patient back to the Call Center—ultimately receiving a call transfer to the Primary Care team in the medical office.

Scope
The scope of the improvement effort focused on medical advice telephone messages that were routed electronically from the centralized Call Center to each of 17 Primary Care medical offices. These messages required a nonclinically trained Call Center agent to answer the call and document the chief complaint and symptoms. The Call Center agent then routed the message to the appropriate medical office where clinical staff and physicians would sort through the messages and return those calls at some future point. These calls represented 20% of the Call Center’s two million annual calls received. The remaining calls handled by the Call Center included appointment requests for Primary Care and other medical specialties, pharmacy requests and general information requests. These calls were considered outside the scope of the improvement effort.

Methods
Using Lean Manufacturing and Six Sigma concepts coupled with Call Center industry technology, a new program was developed to transform the way telephone-based medical questions from a Primary Care Physician’s (PCP’s) panel would be handled. The Six Sigma DMAIC (Define, Measure, Analyze, Improve, and Control) method was heavily leveraged in the development of the solution. During the analysis phase, Lean Manufacturing methods, in particular value stream mapping, flow, and root cause analysis were used. Lean’s concepts of reducing work in process to decrease completion time and removing wastes, most notably those related to overproduction and defects, governed many of the decision points of the effort.

Measuring and Analyzing the Current State
To measure the overproduction and delays associated with the medical advice telephone messaging process, 1) time and motion studies were performed, 2) data was retrieved from Call Center reports, 3) reports were developed to specifically measure the responsiveness of medical offices staff to telephone messages as captured by the electronic medical record, and 4) a third party administered a satisfaction survey sent quarterly to patients.

1. **Time and motion studies** found that, on average, Call Center agents spent 124 seconds per medical advice telephone message and medical office staff spent, on average, 44 seconds calling back the caller, waiting for the phone to ring, and leaving a message when unable to reach the originator of the request. All of this time was non-value-added in the system. From a patient satisfaction perspective, value is primarily added to these types of calls only when speaking to their PCP or a clinical team member of that PCP in their home medical office.

2. **Standard Call Center reports** were used to assess the impact process and system change would have in the
Call Center. Key metrics included the average speed of answer for all inbound calls and the percentage of calls answered within 60 seconds. The number of Call Center agent full-time employee resources needed to provide improved service was also tracked.

3. The electronic medical record (EMR) documentation yielded more evidence of waste in the system. For every 100 telephone messages routed to the medical office by the Call Center on average, EMR documentation revealed that 130 return call attempts were made by that medical office. This highlights the frequency of occurrence that the medical office staff or clinician received no answer or was forced to leave a voice message to have the patient call back. Furthermore, the analysis showed that on average 21% of patients were required to place a second call back to the Call Center before being manually transferred to the medical office after having previously left a message. This loop of wasteful overproduction in the system was referred to as the ratio of telephone tag in the system.

4. Patient satisfaction with the ability to contact physicians or care delivery teams with a medical question was tabulated on a quarterly basis by a third party survey administrator. Before DirectConnect, this measure maintained a nine quarter mean of 54.6% satisfaction with ease of contacting clinician with a range from 44.0% to 59.0%, an upper control limit of 68.9%, and a lower control limit of 40.3%.

**Intervention**

DirectConnect seeks to provide a way to more efficiently and effectively handle increases in Primary Care-related call volume that comes with growing patient demand and with increasing use of the telephone as a key channel of communication between patient and physician. By streamlining this channel of communication, DirectConnect aims to increase the level of trust between patients and physicians by increasing the frequency that medical advice is delivered to the patient by a caregiver known and trusted by the patient—typically by their personal PCP or their physician’s team. Increasing the frequency of real-time response to a patient’s medical question by a known, trusted caregiver became the hallmark of the DirectConnect process of telephone request management for PCPs and their care delivery teams.

**Pilot**

With the data made available as a result of the analysis phase, a manual system was designed to pilot the removal of the telephone tag associated with the medical advice telephone messaging. Three medical offices—one housing general Internal Medicine physicians, one with Pediatricians, and the third with a mixed Primary Care model of general Internal Medicine, Family Medicine, and Pediatrics—were selected. These medical offices began a pilot in which, when a call was received, the Call Center agent would remain on the line and would transfer the call directly to the patient’s home medical office, instead of creating an electronic message. Although this pilot required that the Call Center absorb the cost of spending more time on the line with patients while waiting for the medical office staff to answer—the return call volume declined dramatically. This decline was as a result of handling a greater percentage of would-be electronic messages in real time—a Lean Manufacturing concept known as single-piece flow, versus the prior method of electronic messaging, which was more akin to the Lean Manufacturing concept of batch-and-queue.

**Technological Intervention**

Once the initial pilot was successfully completed, a technological intervention pilot was funded and implemented that allowed the system to automatically identify the PCP, capture the nature of the call—whether a medical question or appointment request—match these attributes, and direct the call to the appropriate staff member. Additional attributes were included in the design that allowed the system to evaluate and to predict the next available staff member and that ensured calls would not be queued for longer than an agreed-upon threshold. Further system revisions were made throughout the implementation to present any waiting callers with the option to remain holding or be...
Primary Care DirectConnect: How the Marriage of Call Center Technology and the EMR Brought Dramatic Results—A Service Quality Improvement Study

Immediate transfer of calls to a Call Center agent for the patient to leave an electronic message. This puts the decision to remain or hang up in the hands of the patient. If the caller selected the option to leave a message instead of remaining on hold, the call would be seamlessly routed to the next available Call Center agent where an electronic message would be sent to the medical office in traditional fashion (Figure 3).

Models and Options

During the first two months of deployment, several call routing models and medical office workflow options were tested. Best practices were shared and adopted. The result has been sustained improvement in all 12 quarters following implementation. Weekly reports indicating medical office performance are posted and accountabilities are in place to ensure results are sustained. Since full deployment in July 2007, DirectConnect calls consistently represent between 15% to 20% of overall Primary Care telephone volume, with one outlier of 22% in November 2008 (Figure 4). This suggests that patients who learn the system are not inclined to abuse the service beyond what is required on the basis of their request. Although medical office staff answers 98% to 100% of all DirectConnect calls to the medical office, some physicians have chosen to log into the system as part of their daily routine when returning calls to patients. This capability allows physicians who wish to deliver a significantly higher level of service to their patients the opportunity to do so.

Results

With the system and associated processes implemented, dramatic gains have been achieved without adding any resources in the medical offices and while reducing the resource requirements of the Call Center. Today, 14% to 17% of total annual inbound call volume is answered by the home medical office. For each of these calls, the Call Center need not answer them, create telephone messages for them, or route them to the medical office where the patient must wait for a return call later in the day. Furthermore, the Call Center’s speed of answering calls improved by 54% in the first quarter after implementation compared to the same quarter from the year before.

Now, for every 100 documented inbound telephone advice encounters that fall within the scope of DirectConnect on average, 79 requests are handled on the first call by the patient’s home medical office physician or team. Although the remaining 21 requests require additional research or a higher skill set to be satisfied, the return calls required to reach the patient are lower when the telephone encounter originates in the home medical office—presumably because the medical office team can provide a more targeted call back time than the centralized Call Center. This increases the odds of reaching the patient when the return call is made. Thus, the system has experienced a documented 26.9% reduction in required return calls because of DirectConnect. This reduces the number of non-value-added steps associated with the medical advice request process from 193 (Figure 2) to 45 (Figure 5). The removal of these non-value-added process steps yields a weekly time savings of between 198 and 247 hours per week in unnecessary telephone work for Call Center and medical office staff.

Patient satisfaction with the ability to contact their PCP or Primary Care delivery team with a medical...
The key driver of improvement, has improved a statistically significant 14% and maintained a nine quarter mean of 70.2% satisfied with a range from 65% to 79% and a lower control limit of 62.6% since implementation.

Discussion

Key Successes

DirectConnect enabled significant improvements for the patients of KPCO while eliminating system barriers that hampered PCPs and staff from providing the high level of service they desired (Table 2). By systematically driving 14% to 17% of KPCO’s inbound telephone volume directly to the home medical office of the patient, Call Center service levels have improved beyond the internal target of 80% answered within 60 seconds (Figure 6) while maintaining an average speed of answering inbound calls below the 60 second mark in each month following the DirectConnect deployment. These Call Center improvements occurred without adding Call Center staff. In fact, the DirectConnect system’s financial breakeven point occurred ten months after full deployment as a result of savings generated by Call Center agent attrition—while maintaining these improved levels of service.

Removing call volume from the centralized Call Center and routing those calls directly to the home medical office of the patient will, on the surface, appear to necessitate a need to shift resources to those medical office buildings to handle the volume; however, because of the single-piece flow nature of the new system, this process is far more efficient for the medical office staff than the previous batch-and-queue process associated with electronic messages. Medical office staff and PCPs make 26.9% fewer return calls; this equates to a time savings 198 to 247 hours per week across the system.

Most importantly, these measurable improvements in both Call Center and medical office areas have led to statistically significant improvements in patient satisfaction—the ultimate objective of the DirectConnect implementation. From the pre-DirectConnect mean of 55.9% satisfaction with the patient’s ability to contact their physician, this measure increased to a mean of 70.2%—14.3% higher than the mean of the previous process, and 3.3% higher than the eight quarter upper control limit of the previous process (Figure 7). DirectConnect has brought KPCO patients closer to their physicians and the Primary Care delivery teams that know them. The barriers that once existed as a

<table>
<thead>
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<th>Table 2. Key Results</th>
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<tr>
<td>Seventy percent to 80% of DirectConnect-eligible calls are answered in the medical offices. The remaining 20% to 30% are seamlessly routed to the Call Center and follow the traditional electronic message process.</td>
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<tr>
<td>Fourteen percent to 17% of all Primary Care call volume is now handled by the patient’s home medical office team.</td>
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<tr>
<td>Medical office return call rate dropped from 1.3:1 to 0.95:1, a reduction of 26.9%.</td>
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<td>Centralized Call Center speed of answering calls improved by 54% in the first quarter after implementation.</td>
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<tr>
<td>Mean quarterly patient satisfaction with ease of contacting Primary Care Physician improved from 55.9% to 70.2% and hit 79% in the most recently reported quarter (QIII 09).</td>
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<td>No additional medical office staff has been added.</td>
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Figure 6. Call Center percentage of calls answered within 60 seconds by month.

Figure 7. Quarterly patient satisfaction with ability to contact physician before and after implementation of DirectConnect beginning in QIV 2006.
result of the desire to gain economies of scale through a large, centralized Call Center have been mitigated. This system has pleased physicians, medical office staff, and those seeking care (Table 3). As health care seeks to better meet the needs of the population, systems like DirectConnect lend credence to the concept that large health plans and provider groups can foster better communication with members and patients without sacrificing affordability of care.

Future

The future implications of this marriage between Call Center technology and the electronic medical record are exciting. Once a technical interface is created between the caller’s EMR and the Personal Physician—as in the DirectConnect system—new opportunities to creatively connect patient and physician exist. For example, on the basis of diagnosis, stratification of patients may occur to automatically route them to the nurse who is most equipped to handle questions related to their condition. Additionally, physicians may be able to establish one-time clinical rules that permit the patient to be directly routed to the physician’s mobile phone upon their next call if important information exchange is needed. Within the context of the telephone system, a mobile phone could be considered part of the greater call routing system, thereby falling under the umbrella of load balancing and call handling redundancy to ensure that calls are not left unanswered. This system creates a foundation on which the relationship between the patient and their personal physician can be further enhanced.

Disclosure Statement

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

References
“The Medusa of Alcoholism”
sculpture
ceramic and glass
26 x 21 x 15”

By Lorenzo Mills, MD

Dr Mills is a retired Pediatrician from the Napa Medical Center in CA. He has been creating narrative sculptural pieces since 2000.

This piece was created in 2009 to portray the seduction of alcoholism via the figure and the danger of alcoholism via the shard snakeheads of broken liquor bottles.
Special Report

The Limits of Tolerance: Convicted Alcohol-Impaired Drivers Share Experiences Driving Under the Influence

Sandra C Lapham, MD, MPH, FASAM

Abstract
Most people are aware that regular alcohol drinkers can become tolerant to the effects of alcohol. Tolerance can lessen the outward manifestations of intoxication, and this poses challenges for the drinker and other observers, including law enforcement officers. On the basis of a National Institutes of Health-funded longitudinal study examining a cohort of convicted alcohol-impaired drivers, this article presents commentary regarding this phenomenon in offenders convicted of driving under the influence and the implications for traffic safety.

B’s Story
The arrest for driving under the influence (DUI) came as a surprise to B. Still, he took it pretty well. On one hand, he had known that he was breaking the law; on the other, he had concluded long ago that the law did not apply to him. B, age 47 years, is divorced, employed, and, unless sick, drinks a fifth of rum most days. Drinking is important to B. It calms his nerves and lifts his mood. Besides, he is often bored. Drinking, combined with his favorite hobby, biking—he owns a Harley—keeps him amused on his days off. During his weekend forays, B stops at bars or parks along the way to drink beer. B says his risky behavior has lessened since his younger days. Now he doesn’t drink “hard stuff” on days he rides his motorcycle.

Blood Alcohol Content
Apparently, B assumes beer is more benign than rum. In my experience, this is a common misconception among convicted drunk drivers. A number of offenders have told me flat out that they can’t be alcoholics because they only drink beer. Beer does contain less alcohol per ounce than hard liquor, and perhaps people mistakenly equate liquor’s quick high with addiction predilection. Beer is by far the preferred drink among convicted DUI offenders, but a standard drink of a 12-oz can of beer, a 1 ½ oz “shot” of 80-proof distilled spirits, or a 5-oz glass of wine all contain the same amount of pure alcohol, 13.7 gr (0.6 oz). The total amount of alcohol consumed, plus other moderating factors, not the type of alcoholic drink, determines the blood alcohol concentration (BAC).

The National Institute on Alcohol Abuse and Alcoholism estimates that consuming five or more drinks in about two hours (four or more drinks for adult females) brings the BAC to 0.08% or above, the legal limit for driving in all 50 states.1 The estimated BACs for children are different. With five drinks within two hours (the level used to define binge drinking among college students), children, ages 9 to 13 years, may have BACs two to three times the adult legal limit for intoxication.2 Several factors moderate the absorption, distribution, and metabolism of beverage alcohol. The presence of food in the stomach slows absorption. Drinking slowly and drinking more diluted alcohol allows the body to metabolize it while at the same time absorbing an incoming dose. Most people eliminate about one drink each hour from their system. An enzyme produced in the stomach, glutathione-dependent formaldehyde dehydrogenase, breaks down alcohol, decreasing its bioavailability. Alcohol is distributed in tissues according to water content. A person’s weight and sex determine the total volume of body water and, therefore, the BAC after drinking a certain

Sandra C Lapham, MD, MPH, FASAM, is a Board-Certified Specialist in Internal and Addiction Medicine. She is Director of the Behavioral Health Research Center of the Southwest, a center of the Pacific Institute for Research and Evaluation and Principal Investigator for an NIH-funded longitudinal study examining a cohort of convicted alcohol-impaired drivers. E-mail: slapham@bhrcs.org.
amount of alcohol. In general, the more a person weighs, the larger the volume of body water and the lower the BAC. Alcohol pharmacokinetics differ by gender. Women have lower glutathione-dependent formaldehyde dehydrogenase activity, leading to increased alcohol absorption. They also generally have a higher fat content and less total body water, where ethanol is distributed. This contributes to higher BACs, an enhanced rate of alcohol oxidation in the liver, a slower rate of gastric emptying of alcohol, and higher vulnerability to the toxic effects of alcohol. But another phenomenon, "tolerance," affects not only the BAC, but also the body's capacity to cope with high levels of this toxic chemical.

**Tolerance**

It is well known that regular drinkers, like B, develop tolerance, broadly defined as the ability to resist the action of a drug. Most people, including B, are familiar with the term, "tolerance.” “I have real high tolerance,” he bragged during his interview. “I can drive fine after a few drinks; actually pretty good even after drinking a lot.”

In effect, drink for drink, B feels less drunk and may have less alcohol-induced impairment in speech, gait, and fine and gross coordination than his light-drinking counterparts. The biologic mechanisms of tolerance are complex. Different forms of tolerance have different mechanisms of action. Far from being a simple homeostatic response to the presence of alcohol in the brain, tolerance can develop within various time frames. Acute tolerance, also called “tachyphylaxis,” happens within a single drinking episode. In acute tolerance, signs of intoxication at the same BAC are more pronounced on the ascending than the descending portion of the BAC curve. Most experienced drinkers develop some form of acquired or chronic tolerance. Chronic tolerance is a bodily adaptation that makes a person need to drink more and more alcohol to get the same effect, or inversely, an adaptation that causes less and less response to a recurring dose.

The degree of tolerance, however, varies both within and among individuals. How and why different people develop different manifestations of tolerance are perplexing. Metabolic tolerance refers to changes in the absorption, distribution, metabolism, and excretion of alcohol. These changes lead to a more rapid clearance of alcohol from the body. Tolerance also occurs at a cellular level in the brain itself (called functional tolerance), which reduces signs of intoxication, even at high BACs. Because of tolerance, habitual users may show minimal effects of a dose that would cause an intense reaction in a naïve drinker. Whereas social drinkers may show clear signs of intoxication at a BAC of 0.10%, such as nausea, slurred speech, and lack of coordination, heavy drinkers at that BAC may not show these signs. Added to this, some drinkers are simply less sensitive, by nature, to alcohol's effects. This is characteristic of people with alcohol dependence. Learned expectancies and Pavlovian conditioning also influence tolerance to alcohol's effects.

Still, tolerance has its own limitations, for as the drinking career progresses, over days, years and decades, so does liver damage from alcohol's toxic effects. Factors that may affect the development of liver injury include the dose, duration, and type of alcohol consumed, drinking patterns, gender, ethnicity, and other risk factors, such as obesity, iron overload, infection, and genetic factors. The drinker typically is unaware of this process, but when liver function declines below a certain threshold, tolerance declines. If the drinking continues, the drinker begins to realize that they can no longer continue to "hold their liquor.”

There is a correlation between BAC and the drug's behavioral and emotional effects, but there is also considerable variability. For example, tolerance enables some very heavy drinkers to survive BAC levels considered lethal (in the range of 0.40% to 0.50%). Memorable patients with BACs this high have been reported as conscious and able to carry on conversations. One report from Sweden describes a woman arrested for drunken driving with a BAC of 0.55%.

**T's Story**

It is commonly believed that people who are alcohol dependent are tolerant to all the effects of alcohol, and that tolerance protects a person from impairment caused by alcohol intoxication. T, another person interviewed for my study on the drinking and driving experiences of DUI offenders, fits this description.

“Usually I was the designated driver because my friends say I can drive better than anybody when I’m intoxicated. Other people, five beers and they’re slurring their words or something, but five beers is nothing to me. Even when I first started drinking, I could drink a 12-pack before I felt much effect from the alcohol.”

**Driving Under the Influence**

Both B and T fail to grasp the limitations of their alcohol tolerance. Alcohol’s detrimental effects...
on vision, vigilance, hand-eye coordination, anticipatory judgments, balance, gait, mental alertness, problem-solving ability, estimates of distance, and quick reaction to unexpected hazards are well documented. Driving combines a complex range of physical and mental activities, and all are adversely affected by alcohol.

Epidemiologic studies show that virtually all drivers with BACs above 0.08% to 0.10% are significantly more likely than sober drivers to cause a fatal motor vehicle crash. In landmark studies, Paul Zador calculated relative risks of fatal crash involvement at various BACs. The analyses used data on driver fatalities in single-vehicle crashes from the national Fatality Analysis Reporting System, in conjunction with driver exposure data from the national Roadside Breathtesting Survey. Zador estimates that each increase of 0.02% in the BAC of a driver with non-zero BAC nearly doubles the risk of a fatal crash. Crash risk rises with increasing BAC among all of the age and sex groups studied. At BACs in the 0.05% to 0.09% range, the likelihood of a crash is at least nine times greater than at zero BAC for all age groups. At very high BACs (at or above 0.15%), the risk of crashing is 300 to 600 times the risk at zero or near-zero BACs. Younger drivers with BACs in the 0.05% to 0.09% range have higher relative risks than older drivers because of immaturity, lack of tolerance to alcohol's effects, driver inexperience, and risk-taking propensity.

O’s Story

Tolerance may have duped O into believing he was fine to drive. O, age 26 years, is described as a nice guy, well thought of by friends and relatives. On a warm Sunday afternoon, O enjoyed a backyard barbecue with friends and their families in Santa Fe, NM. He left the party around 11:30 pm. About midnight he was seen driving his Jeep west in the eastbound lane of Old Las Vegas Highway and collided with a vehicle driven by A. She and four other high school girls were part of a caravan heading to a friend’s house. According to a witness, A tried to avoid hitting the Jeep by swerving to the left, and crossing the center lane. When O tried to get back into the correct lane, he allegedly rammed A’s car broadside. The entire passenger side of the victim’s car was crushed, killing all of A’s passengers. Blood tests later revealed O’s BAC was 0.16%, twice the legal limit for intoxicated driving. The mug shot taken after the incident showed O grinning. He may not have felt very drunk, but his inappropriate smile revealed alcohol’s betrayal.

O’s friends from the gathering were dumbfounded. “He was fine,” his friend said, “He hugged my children, myself, and he was fine.” Another friend told police that O wasn’t drunk and that was 30 minutes before the accident. The oft-quoted admonition, “friends don’t let friends drive drunk,” begs the question, how can friends tell if their friends are drunk? Tolerance costs many an observer.

Law Enforcement Challenge

Effective initiatives to reduce alcohol-related traffic injury and death are most likely to have a positive effect if they are comprehensive and community-focused. Such programs include: community collaboration, coordination, planning, and evaluation; court systems with judges and prosecutors who are trained in adjudicating DUI cases; community-based health care interventions for alcohol-use disorders within medical facilities and community settings; community outreach and education regarding impaired driving; and, above all, active and highly visible law enforcement.

Tolerance poses a significant challenge for law enforcement. Signs of intoxication are easy to overlook, even when you are looking. A recent review of three experimental studies on the ability to detect visible intoxication concludes that social drinkers, bartenders, and most police officers misjudge the target’s level of intoxication about 75% of the time. The inability to accurately judge visible impairment shields intoxicated drivers from detection, for US law does not allow officers to pull over and test the BAC of drivers without probable cause. A recent case appealed to the Supreme Court draws attention to this predicament. In Richmond, VA, stopped a suspected drunk driver when a concerned citizen reported his partial license plate number and driver description. When stopped, the driver had slurred speech, watery eyes, and exited his vehicle with difficulty. He subsequently failed the sobriety tests, was arrested, and later was convicted of DUI. The Virginia Supreme Court threw out the conviction because the arresting officer did not observe erratic or unlawful driving. This driver, who had previous DUI convictions and was undoubtedly tolerant to alcohol’s effects, maintained his driving lane with the police on his tail. In other words, there was no probable cause. The US Supreme Court subsequently declined to hear the case.
Besides citizen call-ins, sobriety checkpoints comprise another widespread law enforcement measure that may be thwarted by tolerance. Checkpoints, conducted in 38 states, are roadblocks set up by law enforcement agents to make the public aware of the DUI laws, and to detect and detain impaired drivers. These roadblocks are an effective anti-DUI measure. The Centers for Disease Control reviewed 23 scientifically sound studies from around the world on checkpoints and concluded that they reduce alcohol-related crashes, typically by about 20%.25 In conducting these checkpoints, officers are trained to look for signs such as open alcohol containers, drug paraphernalia, an odor of alcoholic beverages or other drugs, or the admission of drinking or drug use.26 They are also trained to look for visible signs of intoxication, such as fumbling fingers, slurred speech, inconsistent responses, bloodshot eyes, and other signs of alcohol impairment. However, in tolerant individuals these signs may not be obvious.

Alcohol-impaired drivers are not uncommonly passed over at checkpoints. At checkpoints, officers have little opportunity to monitor a driver’s handling of the vehicle or observe their behavior. If signs of impairment are not salient, the driver will be waved through. In one study, Wells et al29 surveyed drivers not detained by police at 156 sobriety checkpoints in North Carolina. They found that more than 50% of the drivers with BACs over 0.08% were not detained. The authors of that study recommend the use of passive alcohol sensors that detect alcohol in the driver’s exhalations. This evidence is probable cause to conduct field sobriety tests and measure BACs.

**M’s Story**

Does a failure to detect and arrest impaired drivers at checkpoints send the message that they are immune to arrest? Perhaps. Across the board, though, the participants in my study report they fear checkpoints, even when they dodge the arrest. One subject described her DUI history this way:

“I was going out every night to the bars drinking. It was an everyday thing for a couple of years. I’d leave the kids overnight with my mom, go out, and drink and go dancing. This guy would buy our beer—there were 20 beers on the table—and only three or four of us girls. We’d drink shots, too. By the time we left the bar we’d be really bombed. I’ve come close to accidents. About ten years ago I was drinking and I thought my driving was great, but I know now I was a lousy driver because I almost hit my friend’s vehicle. We went to a second bar, and a third. That night I got the DUI.”

After that experience, M cut back on her partying and went out only about once or twice a month. She recounts her attitudes regarding her own alcohol tolerance, and her experience at a checkpoint, on one of those nights:

“My son and daughter-in-law were staying with me, and I lent them the car. I told them to drive me to the bar and pick me up, because I was going to be drinking. Well, my son shows up drunker than me. ‘Good Lord son!’ I said, ‘You know you’re not supposed to be driving my car drunk.’ I took over the driving. I only had four or five beers that night, so I wasn’t drunk, but when we came to a checkpoint we both got scared. When they asked me if I’d been drinking, I told him, ‘No, he has (pointing to my son).’

I’m the designated driver. I must have been talking real good, so be let me go. That would have been my second [DUI]. At that moment I said to myself, ‘No I gotta quit this.’ I’m not taking those chances.”

She quit drinking.

**Conclusion**

People who drink regularly may find they need to drink more and more to get the same effect. This phenomenon, called tolerance, is well described, but incompletely understood. Tolerance reduces the visible signs of intoxication. This makes it hard for others, including friends, alcohol servers, and law enforcement officers, to determine the drinker’s level of driving impairment. Those who experience tolerance commonly believe that since they can “hold” their alcohol, they are capable of driving safely after drinking. But alcohol reduces the physical and mental dexterity required for safe driving. Studies have determined that the risk of causing a crash rises proportionally with BAC. Even at lower BACs (0.05% to 0.09%), the likelihood of a crash is at least nine times greater than at zero BAC. At very high BACs (at or above 0.15%), the risk of crashing is 300 to 600 times the risk at zero or near-zero BACs.

**The Long Term**

M no longer drinks. As for O, he is in jail awaiting trial. B and T both report they continue to drive after drinking. It’s been 15 years since their first DUI convictions. T got a second conviction last year, but B has avoided further arrests. He
is haughty. “It’s like a video game to me. If I make it home, I win. If I don’t, I lose. I know when I’ve had too much to drink, and I don’t drive.”

I doubt it.

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

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Conflicts of Interest in Research—Towards a Greater Transparency

Jeffrey P Braff, DrPH, CIP

Abstract

Recently, substantial undisclosed financial Conflicts of Interest (COI) by researchers at academic medical centers have been discovered and reported in US Senate investigations, prompting large research institutions to take a close look at policies and procedures associated with the reporting and with the management of researcher COI. This article defines COI, reviews the background, describes the problems that arise, and offers solutions.

Background

Researcher conflicts of interest (COI) have received considerable attention in professional journals and the national popular press, as well as various federal government reports. Recently, substantial undisclosed financial COI by researchers at academic medical centers have been discovered and reported in US Senate investigations, prompting large research institutions to take a close look at policies and procedures associated with the reporting and management of researcher COI.

Kaiser Permanente (KP) is no exception. In 2009, approximately $156.3 million worth of research was funded in KP. Of that total, $28.6 million came from industry, $80.3 million from the federal government, $37.8 million from internal KP funding, and the balance of $9.6 million from foundations and associations, and state and local governments. In federal fiscal year 2004, the latest period for which figures are available, KP was the recipient of $24.7 million in grants from the National Institutes of Health (NIH), placing KP among the top 200 recipients of NIH funding that year. One hundred nineteen million dollars (the total research funding less internal KP funding) is a large amount of money from industry and other sponsors, and the risks associated with researcher COI to KP and research participants—putting the interests of the sponsor ahead of the interests of participants or of KP—is one of the reasons research receives such scrutiny. In all KP Regions, for example, institutional review boards (IRB) review proposed human research for ethical and regulatory compliance, and some Regions utilize scientific review committees before proposed research makes it to the IRB in the first place.

KP researchers have been required for many years to declare COI associated with individual research proposals submitted to IRBs. Since 2002, KP has had a policy on the Minimum Standards on Financial Conflicts of Interest in the Conduct of Research, based on US Public Health Service regulations, to which all researchers are held by KP IRBs when an application for initial human subjects research is reviewed.

In response to heightened concern about the potential for severe reputational damage to the institution, KP has recently increased its compliance reporting requirements regarding researcher COI. In 2009, national leaders at The Permanente Federation and Kaiser Foundation Health Plan and Hospitals (KFHP/H) directed that all KP physician and nonphysician researchers (investigators and co-investigators) annually identify investments, relationships, and other situations that might reasonably present or appear to present possible COI with their accountabilities at the Permanente Medical Groups, KFHP/H, and any other KP entity. This year, the Conflicts of Interest Questionnaire for Researchers and associated attestation will be completed by approximately 2000 KP researchers. To assist KP researchers in understanding their responsibilities related to COI, an online tutorial, Conflicts of Interest in Research: A Tutorial for Kaiser Permanente Researchers, is available from KP LEARN (http://learn.kp.org).

What is a Conflict of Interest?

COI is defined as anything that can create a divided loyalty—or the appearance of one—between the researcher, the institution, and the individuals enrolled in...
Another way of defining COI would be a situation in which circumstances that create a risk that a researcher's professional judgments or actions regarding a primary interest (KP and the participant) will be unduly influenced by a secondary interest (a research sponsor, or the desire for professional advancement, for example).14

Interests are broadly characterized into two types: financial, and conflicts of commitment. A financial interest is anything of monetary value, including but not limited to salary and other payments for services, equity interests, and intellectual property rights from companies and/or institutions that are sponsoring research. Financial interests include consulting fees and honoraria, stock, stock options and other interests, patents, copyrights, and royalty rights.15 This definition is necessarily broad, as it is meant to encompass the totality of possibilities that could give rise to a COI, that is, a divided loyalty, or the appearance of a divided loyalty, on the part of the researcher.

Financial interests are further separated by identifying significant financial interests. KP follows the US Public Health Service definition of significant COI, a financial interest that is an equity interest that when aggregated for the researcher and the researcher's immediate family, exceeds $10,000 in value, or is more than 5% ownership interest.16 Immediate family, for purposes of determining COI for KP researchers, is defined as including the following individuals, whether or not they live in the researcher's household: current or former spouse or domestic partner, children or step-children and their spouses or domestic partners, and any related or unrelated individuals living in the researcher's household whose financial holdings are known to the researcher.15 KP researchers are not permitted to participate in research that is funded by a sponsor in which they or a member of their immediate family hold a significant financial interest. In some KP entities, no financial interest of any kind is permitted.

A conflict of commitment occurs when a divided loyalty exists because of nonfinancial ties. For example, this would exist if a researcher was conducting research with an investigational agent, and at the same time was sitting on the scientific advisory board of the agent's manufacturer, even if the researcher did so without pay.

Although a number of institutions address conflicts of commitment in research, COI policies generally focus on financial gain because it is a relatively objective, fungible, and quantifiable construct, as opposed to conflicts of commitment, which may not be.14

**What's the Problem?**

A judgment that a researcher has a COI does not imply that the individual is unethical or has committed a wrongdoing. Such judgments assume only that some situations are generally recognized to pose an unacceptable risk that decisions may be unduly influenced by considerations that should be irrelevant. After having been identified, institutions manage or eliminate these situations in order to preserve the integrity of the research process.

Problems can arise, however, when a COI exists and the conflict is not declared and dealt with in some way by the institution to which the individual owes primary allegiance. At institutions other than KP, there have been a number of instances in the recent past in which researcher COI has figured prominently. In addition to actually or potentially harming research subjects, as well as calling into question research results, the COI and resulting inherently negative publicity have put both the individual researchers involved, and their home institutions, in an unwelcome spotlight. Two examples illustrate this:

- **Harvard University**
  - child psychiatrist Joseph Biederman, MD, earned at least $1.6 million in consulting fees from drug makers from 2000 to 2007 but did not report a third of these fees to Emory University, regarding Dr Nemeroff's alleged lack of compliance with federal COI regulations and Emory University policy, as well as federal regulations.5
  - **Between 2000 and 2007, Emory University psychiatrist Charles Nemeroff, MD, the principal investigator on an NIH study of five GlaxoSmithKline antidepressives, received at least $2.8 million in consulting fees from pharmaceutical companies, including GlaxoSmithKline. He failed to report a third of these fees to Emory.**
  - **Senator Charles E Grassley (R-Iowa), the ranking member on the Senate Finance Committee, who initiated the Nemeroff investigation, took the trouble to have read into the Congressional Record of the US the letter he sent to James Wagner, PhD, the President of Emory University, regarding Dr Nemeroff’s alleged lack of compliance with federal COI regulations and Emory University policy.**
  - **At Harvard and Emory, allegations of researcher COI resulted in reputational damage to both the individual physicians involved and their institutions.** In addition, in situations like this, civil and criminal charges may attach. KP and KP members’ data have been instrumental
in correcting at least one egregious situation that came about partly as a result of COI, that of rofecoxib (Vioxx). Manufactured by Merck and Company, Vioxx, a COX-2 inhibitor, was approved by the Food and Drug Administration (FDA) for the relief of chronic and acute pain.\textsuperscript{17} A study published in the \textit{New England Journal of Medicine}\textsuperscript{18} soon after the drug’s approval reported that Vioxx caused fewer gastrointestinal (GI) complications than naproxen. Minimizing GI complications was a driving force behind the development of the COX-2 inhibitor class of drugs. Disturbingly, all 13 authors of\textsuperscript{19} a study had financial ties to Merck or were employed by the company.\textsuperscript{19} In addition, in yet another study, Merck had deliberately withheld information from the FDA concerning the increase in total mortality of patients on Vioxx compared with patients on placebo.\textsuperscript{20} It is obvious that significant patient harm can occur when hidden COIs exist.

Vioxx was removed from the marketplace about five years after its introduction because KP data had shown that its use increases the risk of serious coronary heart disease compared with celecoxib (Celebrex) when used for arthritis pain.\textsuperscript{21}

From an ethical point of view, it is essential that any involvement a researcher or his/her immediate family may have with sponsors must be transparent and declared. Compliance with federal regulations and institutional policies concerning COI is essential to avoid the type of damage that occurred at Harvard, Emory, and Merck.

What’s the Solution?

COI policies throughout academia and in academic research institutions are varied in terms of how COI is both defined and managed.\textsuperscript{22} Journal requirements for authors to report COI are not uniform.\textsuperscript{14} Arriving at a set of COI policies and standards to which research institutions in the US could subscribe has proven to be elusive. This variability is frustrating both to researchers and to those charged with ensuring compliance with COI policies. The International Committee of Medical Journal Editors (ICMJE), however, has established a uniform format for disclosure of competing interests for authors.\textsuperscript{23} Although only a dozen journals are members of ICMJE, over 600 journals have requested inclusion on the list of publications that follow the ICMJE’s Uniform Requirements for manuscripts submitted to biomedical journals, including this one.\textsuperscript{23} Even so, the format concerns itself with reporting at one point in time, and does not address institutions’ ongoing requirements for COI disclosure.

Closer to home, although KP’s \textit{Principles of Responsibility} addresses COI in general terms,\textsuperscript{24} as does KP’s National Policy on COI,\textsuperscript{25} and the annual COI attestation for researchers is now in place, there is still some variation across KP in practices dealing with declaration of COI at the individual research study level.

Nationally, the Association of American Medical Colleges and the Association of American Universities together have called for a general rule that researchers may not conduct research involving human participants if they have any financial interest in the outcome of the research, for example, if they hold a patent on an intervention being tested in a clinical trial. Exceptions would be allowed only if an individual’s participation is judged to be essential for the safe and appropriate conduct of the research.\textsuperscript{26}

In addition, Senator Grassley, along with Senator Herb Kohl (D-Wisconsin), has authored and introduced the Physician Payments Sunshine Act into the US Senate, requiring annual public reporting by drug, device and biologic manufacturers of payments made to physicians nationwide. In anticipation of being forced to comply with such disclosure legislation, pharmaceutical companies such as Pfizer\textsuperscript{27} and Eli Lilly\textsuperscript{28} have already begun to publicly release such data on their Web sites, while others, such as GlaxoSmithKline,\textsuperscript{29} have promised to do so. Although all pharmaceutical companies are not yet jumping on the transparency bandwagon, having these data will allow institutional officials concerned with COI to cross verify individual researcher attestation data against these records for the companies that currently provide them.

Given the skepticism of “Big Pharma” by politicians like Senator Grassley and by the public generally, it is virtually certain that considerable attention will continue to be paid to researcher COI, and that transparency and uniformity with respect to oversight will likely increase. In addition, the combined efforts at transparency being made by government, industry, the professional and popular media, and academic and other health care institutions such as KP, will also result in increased self-scrutiny by individual researchers and others involved in the research enterprise. Although this introspection may be forced, in some cases anything that enhances transparency regarding COI is to be extolled. \textsuperscript{[a]}

\textsuperscript{[a]} For KP physicians and employees, shares of any value in diversified mutual funds held by a researcher or his or her immediate family do not constitute a financial interest or significant financial interest.

\textsuperscript{[b]} This \textit{de minimis} standard for researchers is espoused by, among others, the Institute of Medicine.
Disclosure Statement

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

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Clostridium difficile Infections: What Every Clinician Should Know

James Yoo, MD
Amy Lee Lightner, MD

Abstract
The leading cause of nosocomial enteric infections in the US is a potentially lethal condition that influences the daily care of medical and surgical patients across all specialties. The incidence is increasing because of the emergence of a new virulent strain, the development of antibiotic resistance, and an increase in infection rates within populations once believed to be at low risk. Current strategies for the prevention, diagnosis, and treatment are cited. Transmission can be minimized with the use of gloves and gowns; proper hand washing with soap and water (alcohol-based washes do not prevent transmission); careful use and proper cleaning of shared patient equipment, such as blood-pressure cuffs, thermometers, and stethoscopes; and the use of bactericidal cleaning solutions. Restricted or judicious antibiotic use will also reduce the incidence of Clostridium difficile infections.

Introduction
As the leading cause of nosocomial enteric infections (diarrhea) in the US, Clostridium difficile infection is a potentially lethal condition that influences the daily care of medical and surgical patients across all specialties and across settings involved in the continuum of health care. Several recent outbreaks since the late 1990s have refocused attention on C difficile, highlighting that the incidence of infection is increasing because of the emergence of a new virulent strain, the development of antibiotic resistance, and an increase in infection rates within populations once believed to be at low risk.1 In parallel, morbidity and mortality rates associated with C difficile infection have risen,1,2 with an increasing number of complications, colectomies, and deaths being reported.3-5 This growing epidemic has heightened our awareness of this infectious organism and its impact on patient care and routine medical practices. In light of these changes, this review article emphasizes the shifting nature of C difficile infections and outlines current strategies for the prevention, diagnosis, and treatment of C difficile infection.

Background and Pathophysiology
C difficile was first described in 1935 by researchers who were studying how bacterial flora are established in the gastrointestinal (GI) tract.6 Hall and O’Toole found an anaerobic Gram-positive rod that was present but, interestingly, harmless in 30% to 50% of newborns.6,7 Although clindamycin-associated colitis was described in 1974, it was not until 1978 that the toxin of C difficile was found in patients with pseudomembranous colitis.8 Now, approximately 300,000 cases of C difficile colitis occur annually in the US, and the associated health care costs are high.9 C difficile colonizes the GI tract after the normal gut flora are altered, typically after antibiotic use. C difficile can release two exotoxins (toxins A and B), both of which can cause tissue damage. Binding to intestinal epithelial cells can lead to cell necrosis and shedding (ulceration), fluid secretion (diarrhea), and inflammation (colitis). The overall risk of developing C difficile–associated diarrhea (CDAD) after antibiotic use is unknown. It is known that the use of all antibiotics can lead to CDAD, even vancomycin and metronidazole, the two primary antibiotics used for the treatment of CDAD. Interestingly, only one-third of colonized patients develop symptoms. It is unclear why two-thirds of colonized patients remain asymptomatic, though this may be due to the development of an appropriate immune response with the production of immunoglobulin G (IgG) antibodies directed against the toxins.

Clinical Presentation
The clinical presentation of CDAD is classically a watery diarrhea, but can also include voluminous and, less commonly (<5%), bloody diarrhea. Although most
patients have symptoms of lower abdominal pain, fever, and leukocytosis (sometimes with white blood cell counts of >30,000/μL), the spectrum of complaints includes mild diarrhea to abdominal distension, dehydration, metabolic acidosis, toxic megacolon with a notable absence of diarrhea, and sepsis with multisystem organ failure. Extra-intestinal involvement, including cellulitis, necrotizing fasciitis, and reactive polyarticular arthritis, has been reported as well. Because of the notable difference in the severity of symptoms, physicians must have a high index of suspicion, especially for at-risk patients with diarrhea.

It is important to distinguish CDAD from antibiotic-associated diarrhea, which is an osmotic diarrhea unrelated to C difficile. Antibiotic-associated diarrhea results from a reduced ability of intestinal flora to break down unabsorbed carbohydrate, which causes an osmotic load, leading to diarrhea. Stopping oral feeding will stop osmotic, antibiotic-leading to diarrhea. Stopping oral drate, which causes an osmotic load, break down unabsorbed carbohy-

**Characteristics of a Hypervirulent Strain**

Outbreaks of high-mortality CDAD have been reported in the US and Canada since the early 2000s. The causative agent is a new, more virulent strain of C difficile, designated alternatively as BI, NAP1, or ribotype 027 toxintype III. This specific strain is highly resistant to fluoroquinolones, is associated with fluoroquinolone and cephaplorins, and fluoroquinolo-

Although BI/NAP1/027 isolates existed previously, historic strains were less resistant to fluoroquino-

**Prevention**

Transmission occurs via the fecal-or oral route. Therefore, effective infection-control practices could largely control the transmission and development of C difficile infection. Transmission can be minimized with the use of gloves and gowns; proper hand washing with soap and water (alcohol-based washes do not prevent transmission) ...
with a sensitivity of 94% to 100% and a specificity of 99%. Although the specificity is high, this assay is expensive and time-consuming, with a test time of two to three days, making it impractical for routine use. Recently, the toxigenic culture and polymerase chain reaction have replaced the cell cytotoxicity culture assay as the preferred assessment tools. The toxigenic culture has increased sensitivity,\(^22\) and polymerase chain reaction produces markedly faster results.\(^23\)

It is important to point out that false-positive and false-negative test results can occur. False-negative results have been reported to occur in 29% to 56% of cases,\(^24,25\) so if the level of clinical suspicion is high, treatment should be initiated despite negative results. A false-negative test result can be generated by failure to test a specimen promptly, failure to keep the stool sample on ice to prevent toxin degradation at room temperature, or failure to generate an adequate sample size. A toxin assay finding may remain positive for several months, so a repeat toxin assay is of limited value in assessing recurrent or persistent diarrhea after treatment.

Diagnosis can also be made by flexible sigmoidoscopy. This may be indicated if there is a high degree of suspicion regarding a patient whose test results for \(C.\) difficile toxin were negative or in patients requiring a rapid diagnosis that would preclude a delay in laboratory testing. Endoscopy is generally contraindicated in patients with confirmed disease or in patients with fulminant colitis, as there is a risk of perforation with the procedure. Endoscopic features include the presence of pseudomembranes, which are yellow-white raised plaques with localized edema and hyperemia, surrounded by intervening areas of normal mucosa. Pseudomembranes are seen in roughly 50% of patients, but because they may be right-sided, evaluation by flexible sigmoidoscopy might miss the diagnosis. It is important to note that \(C.\) difficile can infect the small bowel as well, so the absence of a colon does not exclude the diagnosis.

**Treatment**

After the diagnosis has been confirmed, basic treatment strategies involve stopping the inciting antibiotic, correcting any fluid and electrolyte imbalances, avoiding antiperistaltic agents, initiating contact precautions to limit spread, and treatment of patients with antibiotics if there is evidence of colitis (fever, elevated white blood cell (WBC) count, computed tomography scan findings [Figure 1]), if there is persistent diarrhea despite stopping antibiotics, or if the inciting antibiotic must be continued because of a coexisting infection.

**Standard Treatment Regimens**

Standard treatment regimens include the administration of metronidazole, 500 mg orally three times a day for 10 to 14 days; metronidazole, 250 mg orally four times a day for 10 to 14 days; and oral vancomycin, 125 mg four times a day for 10 to 14 days. Metronidazole (but not vancomycin) can also be given intravenously for patients with an ileus. Rectal vancomycin can be administered as a retention enema. Important considerations are that vancomycin use can lead to vancomycin-resistant Enterococcus and that vancomycin tablets are more expensive than metronidazole tablets: For inpatient hospital setting in the US, in 2010, a 500 mg metronidazole tablet costs 7 cents and a 250 mg tablet of vancomycin cost $29. However, \(C.\) difficile has become more refractory to treatment with metronidazole, and there is a new, less-expensive liquid form of vancomycin available.

![Figure 1. The most common finding on computed tomography scans is thickening of the colon wall, from 3 mm to 3 cm. The thickening is pan-colonic here, although it can also be focal. Contrast trapped within very thick haustra, producing alternating bands of high and low density, is called the accordion sign. Minimal pericolonic stranding and ascites are present.](image-url)
Review Article

Clostridium difficile Infections: What Every Clinician Should Know

Treatment of Colonized, Asymptomatic Patients

Treatment of colonized, asymptomatic patients is not effective. Asymptomatic fecal excretion is not affected by metronidazole, and though the toxin can be eliminated by vancomycin, most carriers have positive culture findings after therapy is discontinued.

Relapse

Relapse occurs in 10% to 25% of cases. Although it is suspected that noncompliance by patients and misdiagnosis contribute to recurrence, the true etiology of recurrence remains unknown. True relapse represents a persistence of spores, a failure to mount an immune response (IgG), or both. Once the diagnosis has been confirmed, treatment is reintiated. A tapered or pulse vancomycin regimen should be considered and should last several weeks (125 mg four times a day for one week, then twice a day for one week, once a day for one week, every other day for one week, and finally, every three days for one week), on the basis of the concept that persistent spores convert to toxin producers and are killed when antibiotics are given repeatedly over time.

Antibiotic Resistance

In 1983, a prospective randomized trial demonstrated no difference in treatment success between vancomycin and metronidazole. Current research data suggest that metronidazole has become less effective in treating CDAD, with higher rates of resistance (9%–25%) and recurrence (20%–40%) in recent years compared with historical controls. Other studies have suggested that treatment success with metronidazole depends on patient age, with patients older than 65 years having the highest rates of recurrence and treatment failure compared with younger patients. Current evidence supports the use of either vancomycin or metronidazole for treatment of mild C difficile colitis, whereas vancomycin has been found to be superior for the treatment of severe C difficile colitis. In the study by Zar et al, mild CDAD was successfully treated with metronidazole or vancomycin in 90% and 98% of cases, respectively. However, in patients with severe CDAD, treatment was successful with metronidazole or vancomycin in 76% and 97%, respectively. For high-risk patients (immunosuppressed, elderly, etc), vancomycin should be used an initial therapy, possibly in combination with metronidazole.

Alternative Therapies

In addition to the treatment strategies already discussed, there are alternative therapies for recurrent or severe CDAD. Anion-binding resins, such as colestipol (5 g every 12 hours) and cholestyramine (4 mg 3 or 4 times a day), work by binding to C difficile toxins, promoting their fecal excretion. These are generally given for 1 to 2 weeks with vancomycin. However, these resins must be given 2 to 3 hours apart from vancomycin because they bind not only the C difficile toxins but vancomycin as well.

Probiotics, including Saccharomyces boulardii, Lactobacillus rhamnosus, and L plantarum, have been suggested because of the theory that restoration of the normal bacterial flora will reduce C difficile infection. Unfortunately, study results analyzing the use of probiotics for CDAD have been generally inconclusive, with insufficient evidence to support their use.

With increasing antibiotic resistance, alternative antibiotics (eg, rifaximin, nitazoxanide, metronidazole) have been considered in addition to metronidazole and vancomycin. Various studies have reported high treatment success and low rates of remission.

One of the most frequently discussed but seldom used treatments for recurrent or refractory CDAD is fecal bacteriotherapy, also playfully termed a “fecal transplant.” Like probiotics, this therapy is based on the concept that restoration of the normal bacterial flora will effectively treat CDAD. At least 17 studies have been reported of roughly 150 participants, with success rates reported in the range of 70% to 90%. Fecal bacteriotherapy can be administered in an enema form or via a nasogastric tube. One proposed regimen involves a mechanical bowel preparation (eg, use of GoLYTELY), followed by a fecal enema consisting of the donor feces (200–300 g) diluted in 250 mL of normal saline. The enema, which should be retained for 6 to 8 hours, should be given within 2 hours of preparation. The fecal enema is administered daily or twice daily for 5 to 14 days.

Lastly, use of intravenous immunoglobulin has also been reported in the treatment of severe, recurrent, or refractory CDAD and has been shown to be effective in various case series.

Surgery

The need for colectomy in patients with C difficile colitis has increased in parallel with the increasing incidence of fulminant colitis and toxic megacolon. Fulminant colitis typically manifests as severe lower quadrant pain or diffuse abdominal pain, diarrhea, abdominal distension, fever, hypovolemia, lactic acidosis, and marked leukocytosis (WBC count of ≥40,000/µL). Because many patients have pro-
longed ileus due to pooling of secretions in the dilated, atonic colon, they may have minimal diarrhea. Fulminant colitis can progress to toxic megacolon, characterized by colonic dilation >7 cm in association with signs of sepsis, and even bowel perforation necessitating emergency surgery. Surgery for *C. difficile* colitis has been associated with a reported mortality of 35% to 80%. Poor surgical outcomes have many causes but are related in part to an older, sicker patient population. The key decision regards the timing of surgery. When the need for surgery becomes obvious to all caregivers (eg, in the setting of perforation or multisystem organ failure), the decision has probably come too late, and surgical mortality in this setting will be high. However, the timing of an earlier intervention must weigh the potential advantages of reduced surgical mortality against the possibility that surgery might not have been necessary. This decision requires careful judgment and experience and is made easier by vigilant monitoring of the patient’s clinical course, by frequent serial examinations, and by a high level of suspicion, as the patient’s condition may rapidly deteriorate. At the time of surgery, the external appearance of the colon may be deceptively normal. Despite this, surgical treatment should be aggressive and include subtotal colectomy rather than hemicolectomy.

**Emerging Treatment Strategies**

Despite generally effective treatment strategies, new, promising treatments are necessary in an era of new virulent *C. difficile* strains, worsening antibiotic resistance, and an ever-aging US population that is at higher risk for infection. One such treatment is the drug evamer, a non-antimicrobial styrene derivative toxin-binding agent that does not have any antibiotic properties and does not affect the normal gut flora. The drug is currently in testing but has not yet been approved by the US Food and Drug Administration. Another alternative in trials is active immunization with a parenteral toxoid vaccine. Use of this vaccine is based on the concept that the humoral immune response (ie, the production of antibody directed against toxins A and B) influences the clinical response to *C. difficile* infection. Preliminary data demonstrate that the vaccine does in fact lead to the production of antitoxin A and B IgG. Its effectiveness for preventing CDAD is currently unknown. A recently studied drug that appears to be promising is a monoclonal antibody, which, when studied with vancomycin or metronidazole, was found to produce a decreased rate of *C. difficile* recurrence.

**Conclusion**

Despite historically effective diagnostic and therapeutic tools, and our potential ability to limit transmission with appropriate infection-control practices, *C. difficile* infection remains a prevalent health concern. Recent outbreaks of *C. difficile* due to the development of new virulent strains and antibiotic resistance, and the emergence of infections in previously low-risk populations, demonstrate the changing character of *C. difficile* infections and highlight the need for more rapid and reliable diagnostic tools, better treatments, and the implementation of better prevention strategies and infection-control practices. 

**Disclosure Statement**

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

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CASE STUDY

Late-Presenting Complications After Splenic Trauma

Sandra Freiwald, MD, FACS

Abstract
Since the 1970s, the management of blunt splenic trauma has evolved from almost exclusive surgical management to selective use of nonsurgical management in hemodynamically stable patients. Understanding of the spleen’s immunologic importance in protection against overwhelming postsplenectomy infection led to development first of surgical techniques for splenic salvage and later to protocols for nonsurgical management of adults with blunt splenic injury. The evolution of nonsurgical management has resulted in new patterns of postsplenic trauma complications.

This article describes a pancreatic pseudocyst, one of several described delayed complications of nonsurgical management of blunt splenic trauma. Along with missed splenic injury and delayed rupture, the development of a splenic pseudocyst represents challenges for any multidisciplinary team involved in trauma care. Detection and management of these complications is discussed, as is postsplenectomy vaccination and return to activity.

Case Presentation
A man, age 19 years, presented to his Primary Care physician with left upper quadrant pain. One month earlier, he had been found to have infectious mononucleosis. Outpatient abdominal ultrasonography revealed splenomegaly with contour irregularity of the spleen. Computed tomography (CT) demonstrated a very large splenic pseudocyst (Figure 1). He was referred to general surgery for further treatment.

The patient was a high school athlete who had been recruited to attend a prominent university on a sports scholarship. He was scheduled to begin training approximately five months after presenting to the general surgery clinic. He requested an intervention that might allow him to return to sports as quickly as possible.

After consultation with an attending trauma surgeon at a local trauma center, plans were made for Interventional Radiology to aspirate the pseudocyst. A clinician easily removed 1500 mL of old blood, and only a small residual fluid collection remained after the procedure. One month later, follow-up CT demonstrated reaccumulation of the fluid. This time, an indwelling drain was placed by Interventional Radiology. Over the next month, the fluid collection resolved and the drain was removed.

One month later, the patient reported increasing left upper quadrant pain. Repeat CT demonstrated recurrence of the fluid collection. It was again percutaneously drained, this time augmented by the use of tissue plasminogen activator administered through the drain. Another month passed, the fluid collection resolved, and the spleen appeared normal on CT. The drain was removed.

The patient did well for one month. He attended training camp after the team physician was contacted and fully apprised of the patient’s recent medical history. Unfortunately, the patient became febrile. Laparoscopic splenectomy was attempted and was unsuccessful. He therefore underwent open splenectomy and recovered uneventfully.

Figure 1. Large splenic pseudocyst

Sandra Freiwald, MD, FACS, is a Surgeon and Assistant Chief of General Surgery at the San Diego Medical Center in CA. She is a Voluntary Assistant Clinical Professor at the University of California, San Diego. E-mail: sandra.l.freiwald@kp.org.
Missed splenic injury is the most common cause of preventable death after blunt abdominal trauma.²

Missed Splenic Injury

Missed splenic injury is the most common cause of preventable death after blunt abdominal trauma.² Compared with patients in whom injury is promptly recognized, those with delay in diagnosis of splenic trauma have a ten-fold increase in mortality.³ It is therefore important to have a high index of suspicion for this diagnosis when evaluating patients with blunt trauma. The most common finding associated with splenic rupture is left lower rib fractures, which occur in >40% of cases. When such fractures are present, further assessment with abdominal and pelvic CT is required. The classic triad associated with blunt splenic rupture—left hemidiaphragm elevation, left lower lobe atelectasis, and left pleural effusion—is frequently absent and cannot be considered a reliable indicator. Any patient who does have left hemidiaphragm elevation after blunt trauma should be considered to have a splenic injury until it is proven otherwise. Once the diagnosis is made, treatment depends on the hemodynamic condition of the patient. Unstable patients require emergency splenectomy, whereas those in stable condition can undergo nonoperative management.

Delayed Rupture of the Spleen

Delayed splenic rupture was first described in 1902 by Baudet,⁴ who noted its occurrence 48 hours after trauma. The incidence is approximately 1%, and it tends to occur between 4 and 8 days after injury.³ Mortality ranges from 5% to 15%, compared with 1% mortality for acute injury.⁵ Potential mechanisms include expansion of a subcapsular hematoma, clot disruption, or rupture of a pseudoaneurysm or splenic pseudocyst. Prompt recognition of the signs and symptoms of delayed splenic rupture is essential. Patients typically exhibit hypotension, tachycardia, worsening abdominal pain and distension, and a decreasing hematocrit. The treatment of choice is splenectomy, as splenorrhaphy can be extremely difficult in patients in whom surgical treatment has failed. Some centers will perform angioembolization in hemodynamically stable patients.

Splenic Pseudocyst

The diagnosis of splenic pseudocyst is becoming more common, probably because of the increasing use of CT and ultrasonography to evaluate complaints of upper abdominal pain as well as the increased frequency of nonoperative treatment of blunt splenic trauma. Thirty percent to 60% of splenic pseudocysts are asymptomatic,⁷ causing problems only as they enlarge. Common presenting complaints include left upper quadrant pain and nausea and vomiting because of compression of the stomach. Diagnosis is made in the setting of a history of blunt abdominal trauma, upper abdominal pain, and a perisplenic cyst on abdominal imaging.

The optimal treatment for splenic pseudocysts remains to be defined. Splenectomy was the traditional treatment of choice. With increasing recognition of the immunologic importance of the spleen, this fell from favor. A number of spleen-preserving techniques have been attempted, including watchful waiting, percutaneous drainage (as done in our case), marsupialization/ fenestration, splenic decapsulation, and complete cystectomy with partial splenectomy. Marsupialization entails making an opening in the cyst wall to allow drainage to occur. Decapsulation requires near-total resection of the cyst while leaving the spleen intact with part of the cyst wall attached to the capsule.

Small series have been reported in the investigation of various methods for treating splenic pseudocysts. Percutaneous drainage has had varying degrees of success, but most series have shown high recurrence rates, sometimes in 100% of patients. Laparoscopic fenestration has been successful in some cases, as has open decapsulation. One series of seven patients concluded that small cysts (<5 cm in diameter) were likely to resolve spontaneously, although this could take up to three years. Larger cysts in that series required some sort of intervention; percutaneous drainage failed in 10% of patients, necessitating cystectomy with splenectomy or splenorrhaphy.⁸ In a more recent series of
six patients, the failure rate for percutaneous drainage and laparoscopic fenestration was 100%. The authors believed that complete removal of the cyst, with partial or complete splenectomy, ought to be the procedure of choice in young, otherwise healthy patients with large symptomatic splenic pseudocysts. In retrospect, this probably would have been the best option for our patient, allowing quicker recovery and fewer invasive procedures.

**Overwhelming Postsplenectomy Infection**

OPSI, typically caused by the encapsulated organisms *Streptococcus pneumonia, Haemophilus influenzae,* and *Neisseria meningitidis,* occurs in 0.05% to 2% of patients who have undergone splenectomy. It may develop immediately or as late as 65 years after splenectomy. Mortality is significant and as high as 50%. It may develop between the ages of 16 and 55 years and Menomune-A/C/Y/W-135) should be revaccinated every three to five years. Long-term studies regarding revaccination are ongoing, and the manufacturers suggest contacting them for their latest recommendation. The HibTITER vaccine does not require repeated administration.

The recommendation to give the vaccines two weeks after emergency splenectomy must be tempered by the patient’s reliability. Many trauma centers give the vaccines immediately before the patient is discharged home in case the patient does not return for follow-up care. In addition to vaccination, all patients must be educated about the signs and symptoms of OPSI and must be instructed to seek immediate medical attention for febrile illness. Asplenic travelers are advised to contact the CDC before traveling abroad, to learn about increased risk of contracting meningococcal infections in sub-Saharan Africa, India, and Nepal.

**Return to Activity**

Another area of controversy in the treatment of patients after splenic trauma is timing of return to activity. Few data exist regarding activity guidelines after discharge from a hospital or trauma center. Traditionally, patients have been told to refrain from physical activity for three months after splenic injury. A survey of members of the Eastern Association for the Surgery of Trauma (AAST) = American Association for the Surgery of Trauma

| Table 1. AAST Spleen Organ Injury Scale (1994 revision) |
|-------------|-------------|----------------------------------|
| Grade | Type of injury | Injury description |
| I | Hematoma | Subcapsular, nonexpanding, <10% surface area |
|  | Laceration | Capsular tear, nonbleeding, <1 cm parenchymal depth |
| II | Hematoma | Subcapsular, nonexpanding, 10% to 50% surface area; intraparenchymal, nonexpanding <5 cm diameter |
|  | Laceration | Capsular tear, active bleeding; 1 cm to 3 cm parenchymal depth which does not involve a trabecular vessel |
| III | Hematoma | Subcapsular, >50% surface area or expanding; ruptured subcapsular hematoma with active bleeding; intraparenchymal hematoma >5 cm or expanding |
|  | Laceration | >3 cm parenchymal depth or involving trabecular vessels |
| IV | Hematoma | Ruptured intraparenchymal hematoma with active bleeding |
|  | Laceration | Laceration involving segmental or hilar vessels producing major devascularization (>25% of spleen) |
| V | Laceration | Completely shattered spleen |
|  | Vascular | Hilar vascular injury which devascularized spleen |
Trauma (EAST) was published documenting how members of this society treat their patients after blunt splenic trauma. In patients with grade I or grade II (Table 1)\(^7\) injury, the majority of respondents allowed resumption of light activity in two weeks and full activity in six weeks. These decisions were rarely based on repeat imaging with CT but were primarily based on clinical judgment. In patients with a higher grade of injury (III, IV, or V), half of respondents allowed their patients to return to light activity in four to six weeks. The other half waited two to three months. As for return to full activity, patients were told to wait for four to six months by 20% of surgeons when they had a grade III injury and by 30% of surgeons when they had a grade IV or grade V injury. Five percent of surgeons did not allow return to full activity for high-grade injuries for longer than six months.\(^8\) With higher-grade injuries, there was more reliance on CT findings after discharge in decision making, which is contrary to recommendations in the current literature.\(^9\)

Pediatric trauma series have demonstrated more concrete evidence of timing for splenic injuries to heal. CT has documented that 90% of grade III injuries healed in 76 ± 7 days and that 77% of grade IV injuries healed within 81 ± 8 days.\(^10\) Although there are no studies proving that adult spleens heal at the same pace as those of children, those healing rates suggest that activity restriction for four to six months for adults may be excessive. As this issue can significantly affect quality of life in a typically young and otherwise healthy population, there is a need for a well-designed study to address it.

**Conclusion**

Delayed complications of blunt splenic trauma may be encountered in settings outside of trauma centers. Practitioners must be familiar with these issues and involve appropriate specialists as needed in the care of patients with splenic injury.\(^\text{11}\)

**Disclosure Statement**

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

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**References**

CASE STUDY

Echinococcus of the Liver Treated with Laparoscopic Hepatectomy

Abstract

Echinococcosis or hydatid disease is endemic to many countries around the world where livestock, mainly sheep and cattle, are raised with dogs who act as the definitive hosts for the adult phase of the echinococcal tapeworm. We report a case of a man, age 22 years, who emigrated from Kyrgyzstan as a teenager, presenting with abdominal fullness and nausea and found to have a 9 cm echinococcal cyst of the liver which was successfully treated with laparoscopic hepatectomy because of a very favorable location.

Case Presentation

We report a case of a man, age 22 years, from Kyrgyzstan who presented with abdominal fullness and nausea. An ultrasound was performed and revealed a complex cystic liver mass. Computed tomography (CT) showed a large, mixed-density mass in the left lobe approximately 9 cm in size, with nondependent hypodense foci (Figure 1). His mother had mentioned another villager was diagnosed with a similar problem and was treated with surgery. Laboratory evaluation revealed no leukocytosis, normal blood count and liver enzymes. Echinococcal antibody was mildly elevated at 1.32 (positive over 1.2) and he was placed on albendazole 400mg bid preoperatively. Because of the advantageous location of the cystic mass, the patient was able to undergo laparoscopic segmental hepatectomy 4 weeks later (Figures 2 and 3). No postoperative complications were noted and the patient continued to do well 2 months after surgery.

Discussion

Echinococcosis or hydatid disease is endemic in the Mediterranean, Africa, Middle East, South America, Australia, Russia, and China where livestock, mainly sheep and cattle, are raised with dogs who act as the definitive hosts for the adult phase of the echinococcal tapeworm. Kyrgyzstan is a small, landlocked central Asian country, bordered by China, Kazakhstan, Uzbekistan, and Tajikistan with an estimated population of 5.4 million people. Kyrgyzstan has a predominantly agricultural economy, producing cotton, tobacco, wool, and meat.

Livestock become infected when they eat food or water contaminated with dog feces which contain the larval form of the tapeworm. Infection leads to cysts in the liver in 75% of cases followed by lung, but can involve any part of the body. Mortality is estimated...
at 5% and sensitization can occur with systemic leakage of cysts into the bloodstream potentially leading to fatal anaphylaxis if a cyst ruptures. Most infections are caused by *Echinococcus granulosus* followed by *Echinococcus multilocularis*.

Laboratory examination can rarely show a peripheral eosinophilia but usually the complete blood count is normal. Serologic testing is 84% sensitive but cannot definitively rule the diagnosis in or out. Imaging with ultrasound can show single or multiloculated cysts with a “snowflake or hail-storm” pattern and signs on CT include daughter cysts with a “wheel, rosette, or honeycomb-like” appearance. Treatment varies depending on the location, size of the cyst, and overall health of the patient. Surgical resection has been the treatment of choice but newer modalities through percutaneous aspiration called PAIR (puncture, aspiration, injection, and re-aspiration of scolicidal solutions) show promise. Patients treated with PAIR usually receive oral medication (albendazole or mebendazole) for 7 days before and 28 days after aspiration to help decrease the risk of recurrence. Surgical options include total pericystectomy, partial hepatectomy, and lobectomy, and can be complicated by bleeding, bile leak from the residual cavity, biliary fistula, or cholangitis. Endoscopic retrograde cholangiopancreatography (ERCP) is employed to mainly assist in postoperative management of these complications. Fortunately, the location of the cyst in our patient made it feasible to perform minimally invasive laparoscopic resection of his lesion.

**Disclosure Statement**

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

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Humanizing Patients through Narrative Approaches: The Case of Murphy, the “Motor-Mouth”

Abstract

Background: Some psychiatric patients are presented as hopeless, burned out, and devoid of social graces. Staff of mental health centers and hospitals are not encouraged to view these people differently. A narrative perspective allows anyone to emerge as a richly complex human being.

Method: A course presented students with the opportunity to create narrative descriptions of patients presented by medical staff as hopeless.

Results: One student’s narrative of “Murphy the Motor Mouth” is presented; it shows the validity and usefulness of the narrative approach in reconstructing a person to be avoided as an interesting, valuable, and richly complex human being.

Conclusion: Murphy in story emerges as more interesting and worthy of knowing than the clinical Murphy constructed by medical staff. Narrative approaches offer a richness and intimacy that fosters a more therapeutic and effective relationship between patients and staff.

Introduction

In our contemporary psychiatric settings, patients are sometimes presented as hopeless, recalcitrant, and “burned out.” In this article we present the result of the interaction of a faculty and a student to change a “burned-out” patient into an interesting person through elicitation of his narrative. Narrative medicine has emerged as a new approach to humanize medicine, along with promoting empathy, and inculcating cultural competence. These approaches have not necessarily failed, but medicine still contains powerful dehumanizing influences.

Methods

As part of a course in narrative medicine, students were encouraged to find patients who had been dehumanized and to interview these patients to produce a narrative of interest about people who had been previously presented as uninteresting and burned out. The patient described herein was presented as a hopelessly recalcitrant “bipolar” with no redeeming social graces. We present an alternative narrative to show how narrative approaches can redeem the hopelessly lost, at least in the eyes of their caregivers, and foster more effective treatment.

Michael Pickren Valenti, MA
Lewis Mehl-Madrona, MD, PhD, MPhil

Abstract

Background: Some psychiatric patients are presented as hopeless, burned out, and devoid of social graces. Staff of mental health centers and hospitals are not encouraged to view these people differently. A narrative perspective allows anyone to emerge as a richly complex human being.

Method: A course presented students with the opportunity to create narrative descriptions of patients presented by medical staff as hopeless.

Results: One student’s narrative of “Murphy the Motor Mouth” is presented; it shows the validity and usefulness of the narrative approach in reconstructing a person to be avoided as an interesting, valuable, and richly complex human being.

Conclusion: Murphy in story emerges as more interesting and worthy of knowing than the clinical Murphy constructed by medical staff. Narrative approaches offer a richness and intimacy that fosters a more therapeutic and effective relationship between patients and staff.

Introduction

In our contemporary psychiatric settings, patients are sometimes presented as hopeless, recalcitrant, and “burned out.” In this article we present the result of the interaction of a faculty and a student to change a “burned-out” patient into an interesting person through elicitation of his narrative. Narrative medicine has emerged as a new approach to humanize medicine, along with promoting empathy, and inculcating cultural competence. These approaches have not necessarily failed, but medicine still contains powerful dehumanizing influences.

Methods

As part of a course in narrative medicine, students were encouraged to find patients who had been dehumanized and to interview these patients to produce a narrative of interest about people who had been previously presented as uninteresting and burned out. The patient described herein was presented as a hopelessly recalcitrant “bipolar” with no redeeming social graces. We present an alternative narrative to show how narrative approaches can redeem the hopelessly lost, at least in the eyes of their caregivers, and foster more effective treatment.

Michael Pickren Valenti, MA, is a graduate student in the Department of Psychology at Argosy University in Honolulu, HI. E-mail: unboundvoice@yahoo.com.

Lewis Mehl-Madrona, MD, PhD, MPhil, is a Clinical Assistant Professor of Family Medicine at the University of Hawaii School of Medicine in Honolulu and Director of Education for the Coyote Institute, S Burlington, VT and Honolulu, HI. E-mail: mehlmadrona@gmail.com.
enjoyed a stable childhood with a family rooted in faith. He never experienced abuse or neglect. Murphy recalled fishing as a child and legendary moments in high school football. He boastfully shared many nicknames including “Kuntukinte,” “Dizzy D,” and “Baby Brain,” but could not recall their origin or meaning. After high school Murphy joined the military. He favorably recalled his time in Korea. Murphy loved the food and the people. He said “I felt love with the people” and “I ate kim chee.” His time in Korea also increased his appreciation for the US. He said, “People here are spoiled brats; they don’t know. They’re just used to having food every day.” He did not experience trauma in the service and was discharged after two years.

A few years after his military service, Murphy experienced two traumatic events: witnessing the murders of his girlfriend and cousin. These events took place in his early thirties. Murphy appeared impenetrable to sadness until these memories emerged. They could silence a Murphy monologue above all else. Despite his high energy, Murphy’s ideology was easygoing. He was a person of the people, someone who did not strive for riches and power. Murphy often felt misunderstood and found refuge from judgment with his friends. Murphy claimed to “hang out with handicap people because they accept [him] for who [he is]” and said “[His] friends work at McDonalds.”

Murphy experimented with drugs and alcohol at an early age. He was smoking cigarettes in the third grade and by the eighth grade using alcohol, marijuana, LSD, and cocaine. He used LSD every day in the summertime as a late adolescent. Despite his avid use, Murphy felt he was cautious. He “found out what [was] safe.” He did not blindly use any drug that came his way; Murphy did his homework. He read books and sought information before feeling comfortable with a substance. Murphy claimed drugs didn’t affect his mind and that they were “just an experience.” He was impenetrable to the effects of drugs. Murphy felt drugs played little part in his life path or current predicament. Despite his research and cautiousness, Murphy did experiment with some extremely dangerous substances. He used ice and sniffed paint, yet remained unscathed. Murphy was a proud marijuana smoker. He animatedly illustrated the joy of using marijuana in all its varieties. He felt it brought friends together and enhanced life.

Murphy’s legal and psychiatric history were unclear. Murphy served five years in prison for robbing a bank. He said he was wrongly convicted, but wanted to serve the time and move on with his life. Murphy was diagnosed with Bipolar I disorder in his early thirties after “staying up for six days and six nights.” His first manic episode appeared to have lasted from “staying up for six days and six nights.” His first manic episode appeared to have six days and six nights.” His first manic episode appeared to have followed the deaths of his cousin and girlfriend. However, because of Murphy’s often tangential, disorganized, and fast speech, he could not construct a coherent timeline. Murphy did not feel he had a mental illness; rather, a “motor mouth” because doctors only give him a diagnosis. He felt very similar on or off drugs. When asked why he took medication, Murphy said, “Because I claim disability and my doctors think I am safe.” However, the medications gave him substantial digestive side effects. He recalled diarrhea so severe that “[he] kept wiping [himself], …” Murphy told many stories of being unable to get to the bathroom fast enough and enduring this very tangible consequence. However, all the side effects disappeared when he took benzotropine mesylate. Murphy spoke highly of benzotropine mesylate and treated it as a saving grace. He insisted on taking benzotropine mesylate while on any psychoactive medication. Without it, the side effects were unbearable.

Benzotropine mesylate was Murphy’s favorite drug. He said it reduced his digestive symptoms. Benzotropine mesylate is known to cause euphoria and excitement. Murphy could have been enjoying the side effects rather than the drug’s primary mechanism. Passion can be expressed in many ways. Some endure years of practice and devote countless hours to perfect a craft. This brand of passion is most familiar to our modern day society. Yet, how many forms can passion take? Must it be hardworking? Murphy was a man of passion. He devoted himself to a lifestyle. From a young age he passionately sought an easy “feel-good sensation.” He walked a path of least resistance to a place of highest pleasure. Undoubtedly, this passion led to drug use. Drugs meet all Murphy’s criteria. To Murphy, his behavior was not a bad habit or pathology,
it was him. In accordance with his philosophy, he didn’t resist physician’s orders. Rather, he took the prescribed drugs, added one for entertainment, and continued to live out his passion. Sparrowing with an opponent who rolls with every punch inevitably leads to the aggressor being unwilling to enter into the dance of the defendant. Murphy took the lead and all medicine could do was to avoid stepping on his toes.

**Conclusion**

“In a larger sense, the biological study of mind is more than a scientific inquiry of great promise; it is also an important humanistic endeavor. The biology of mind bridges the sciences—concerned with the natural world—and the humanities—concerned with the meaning of human experience. Insights that come from this new synthesis will not only improve our understanding of psychiatric and neurological disorders, but will also lead to a deeper understanding of ourselves.”

—Eric Kandel, MD

Narratives give physicians the skills, methods, and texts to learn how to imbue the facts and objects of health and illness with their consequences and meanings for individual patients and physicians.

The narrative about Murphy was more humanizing than the clinical story circulating among the medical staff. In the above story, Murphy emerged as a competent, optimizing, goal-directed human being in stark distinction to the role cast by the medical staff as burned out, hopeless, uninteresting, and annoying. The shift of focus from clinical to narrative allows us to consider the impact of this change of focus. The patient comes to the clinician with a story to tell and wants someone else to hear this story and to reverence it. But the clinician’s role is not simply to be the passive hearer, but to become a participant-observer and a listener. Our narratives carry important messages, both to ourselves and to whomever we are asking to listen. Murphy’s narrative carries a message of competence in contradistinction to the usual clinical narrative of incompetence in which he is usually presented. He maintains an aura of joy in a usual story of despair. A narrative perspective allows Murphy to be seen in all his complexity: his strengths, his joys, his weaknesses, and his despair. All of these operate for such a richly complex individual.

A narrative perspective enriches ordinary clinical care and humanizes medicine to appreciate people as more than their diagnosis and symptoms. It exposes students to narrative ideas while studying standard clinical presentations and it allows students to appreciate the richness of human life over the reductionism of much of clinical science. For this reason, it should be encouraged within the clinical sciences. At the University of Hawai’i, we are beginning to create a Narrative Medicine program to humanize the clinical sciences and to create bridges with the indigenous medicines of the Pacific Rim, which are decidedly based upon stories and the healing impact of “talking story.” Murphy is one of the many patients who would benefit from a narrative approach to psychiatry.

Rita Charon, MD writes that “Narrative medicine has evolved as a means to honor the stories of illness, whether told by the patient, family member, doctor, or nurse. More sharply it has become a way to probe the narrativity of disease, of health, of healing, and of the relation between the sick person and the one who tries to help.” One’s story is more than “just” information. It is us giving to another a part of our soul: our essence. A person’s story is more than a case history of symptoms to be noted as part of a medical assessment; it is something to be prized and honored. Writing of time spent with her patients, Charon has this to say “Through the attention I donate and the authenticity he displays, we grow together in knowledge, in action and in grace, hoping for the best, making it out together ...” This makes narrative into a shared experience where both clinician and patient can give to each other and learn from each other.

Over the past five decades research has demonstrated the immense importance of therapeutic alliance, empathy, and collaboration. Successful treatment is reliably predicted by the presence of these three factors. The aforementioned variables were nonexistent between Murphy and the staff. Murphy was presented to Michael, the student from a distant and critical perspective in which the patient was receiving treatment. The staff offered little interest in Murphy’s perspective as his job was to take what he was given. This is not Murphy’s first stay at the hospital and it likely won’t be his last. Patients like Murphy are often regarded as “treatment failures.” Yet, in the absence of the three most crucial elements of effective treatment, it appears that he’s not failing treatment; treatment is failing him. Viewing patients through
a narrative lens turns a clinical case into a person. When patients become people, collaboration and empathy exist more naturally and the patient enters into a bilateral relationship. The narrative approach is not simply a way to conceptualize, rather a catalyst for the implementation of more effective treatment of our mentally ill.

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References

Moral Treatment

Public asylums for maniacs have been regarded as places of confinement for such of its members as are become dangerous to the peace of society. The managers of those institutions, who are frequently men of little knowledge and less humanity, have been permitted to exercise towards their innocent prisoners a most arbitrary system of cruelty and violence; while experience affords ample and daily proofs of the happier effects of a mild, conciliating treatment, rendered effective by steady and dispassionate firmness.

— Treatise on Insanity, Philippe Pinel, 1745-1826,
French physician, described as the “father of modern psychiatry”
Mammogram

Teri Bordenave, MHSA

I.

Good luck she said as
I left the room, clothes in one
hand, borrowed garment clutched in
the other, protectively, against
my left breast.
My left breast—the one over my heart.
My left breast—the one she just flattened and x-rayed in the darkened room.
My left breast—the one they took another look at today.
My left breast—one of the two that fed my daughter’s life.
My left breast—the one that wears your favorite nipple.
My left breast—the one I now cradle, instinctively, in my sleep.

II.

It was a voice I didn’t recognize,
the one in the message on my phone.
“I’m sure you’ve heard by now,” it said,
“we found some abnormalities
in your mammogram.” Turned out to be
Tanika, film librarian at the diagnostic center
looking to add more x-rays to her collection.
Mine. “So we can compare,” her voice
trailed off as my ears started to close up,
my whole head fell into a large pool
of murky pond water, body following, as I
tried to remember which way was up.
“Evening in the Foothills” photograph

By Gary Larsen, MS

Mr. Larsen is a Clinical Microbiologist in the Bacteriology Department of the Northern California Regional Laboratory in Berkeley. He uses photography as a refreshing excuse to get away from the busy laboratory to peaceful locations and to indulge in his re-energizing hobby.

This photograph was taken on a late afternoon in the Sierra Nevada foothills, approximately halfway between the Kaiser Permanente Fresno Medical Center and its satellite clinic in Oakhurst, CA.
ECG Diagnosis: Wolff-Parkinson-White Syndrome

Wolff-Parkinson-White Syndrome (WPWS) is defined as the presence of an accessory pathway (AP) and has a predisposition to the development of supraventricular tachydysrhythmias. Conduction over an AP circumvents conduction delay occurring within the atrioventricular node (AVN), which leads to early eccentric activation of the ventricles and fusion complexes. If WPWS with atrial fibrillation (AF) is treated by drugs that prolong the AVN refractory period (eg, calcium-channel blockers, beta-blockers, digoxin, adenosine), the rate of conduction through the AP may increase and degenerate to ventricular fibrillation (VF). Unstable patients with WPWS and AF should receive immediate electrical cardioversion. Stable patients can be chemically cardioverted with IV procainamide. Amiodarone should be used with caution due to its ability to cause ventricular rate acceleration and degeneration into VF. Ibutilide is considered an alternative agent, although it has numerous side effects. Cardiology or electrophysiology consultation with consideration for radiofrequency mapping and ablation should occur for patients presenting with AF in the setting of WPWS.

References
Image Diagnosis: Ankle Fractures and Dislocations

Sundeep R Bhat, MD
Gus M Garmel, MD, FACEP, FAAEM

Figure 1. Anterior-posterior view of the ankle
Standard radiographs for suspected ankle injury include anterior-posterior (AP), lateral, and mortise views.1,2 On this AP radiograph, the solid white arrow demonstrates a subtle fracture of the distal fibula; the ankle mortise is intact. On AP ankle films, cortical disruption or talar tilt should be identified. If tibiofibular overlap (TFO)—the distance between the lateral border of the tibia and the medial border of the fibula—is less than 10 mm, or the tibiofibular clear space (TCS)—the distance between the medial border of the fibula and the lateral aspect of the posterior tibial malleolus—is greater than 5 mm, associated syndesmotic injury is likely. Greater than 2 mm difference between the lateral and medial joint space above the talus indicates talar tilt suggestive of medial or lateral disruption of this joint.1,2

Figure 2. Bimalleolar Ankle Fracture
Anterior-posterior (AP) view (left) of the ankle demonstrates fracture of the fibula visualized as cortical disruption along the lateral border and a subtle distal tibia fracture seen approximately 2 mm above the distal tip, with preservation of the posterior border of the tibia (seen on lateral view [right]). In addition, the AP view reveals widening of the medial aspect of the superior talar joint space compared with the lateral space, suggesting talar tilt. This pattern of distal fibula fracture with medial malleolus involvement is often due to supination-external rotation injury and is likely associated with significant joint instability if the deltoid ligament is disrupted.1 A small avulsion of the talar neck is also seen along the medial border, opposite the site of the distal tibia fracture.

Sundeep R Bhat, MD, is an Emergency Medicine Resident in the Stanford/Kaiser Emergency Medicine Residency Program. E-mail: sbhat@stanford.edu.
Gus M Garmel, MD, FACEP, FAAEM, is a Senior Emergency Medicine Physician at the Santa Clara Medical Center. He is also the Co-Program Director of the Stanford/Kaiser Emergency Medicine Residency Program, and an Associate Professor of Emergency Medicine (Surgery) at Stanford University. He is a Senior Editor for The Permanente Journal. E-mail: gus.garmel@kp.org.
Image Diagnosis: Ankle Fractures and Dislocations

**Figure 3. Trimalleolar Ankle Fracture**

Anterior-posterior (AP) (left) and lateral (right) views demonstrate fracture of the distal fibula, medial malleolus, and posterior tibial malleolus with associated shortening. Note the decreased tibiofibular overlap (TFO) and significant talar tilt on the AP radiograph. Fractures that can’t be reduced or which involve widening of the ankle mortise require urgent orthopedic consultation for possible open reduction internal fixation (ORIF) to prevent complications of avascular necrosis, malunion, or nonunion. Subtle nondisplaced fractures or displaced ankle fractures that have been anatomically reduced can be treated with a posterior splint and stirrup, crutches and non-weight-bearing, with close orthopedic follow-up.¹

**Figure 4. Talar neck fracture-dislocation**

Slightly oblique anterior-posterior radiographs show a talar neck fracture-dislocation with associated subluxation of the subtalar joint pre- and postreduction. The talus was reduced into better anatomic position, but talar tilt and joint instability are still evident postreduction. Open ankle fractures (such as this case) are surgical (orthopedic) emergencies, requiring immediate reduction, irrigation and antibiotics, and tetanus vaccination if indicated. This Hawkins Type IV fracture has a near 100% likelihood of avascular necrosis due to the extreme level of displacement.³

References
Introduction
Pressure ulcer treatment is one of many aspects of patient care in which nursing care interfaces directly with clinician-provided medical services. Traditionally, the treatment of pressure ulcers has been left to nurses. No less an authority than Florence Nightingale said in 1859, “If he has a bedsore, it’s generally not the fault of the disease, but of the nursing.” Physicians have tended to be passive participants, routinely cosigning orders written by hospital-based wound-care nurses or home health nurses. Realization of the costs associated with the treatment of pressure ulcers and recent requirements by third-party payers have prompted physicians to become more actively engaged in the prevention, identification, and treatment of pressure ulcers.

Pressure ulcers are localized areas of tissue damage or necrosis that develop because of pressure over a bony prominence. They have previously been called pressure sores, bedsores, and decubitus ulcers, terms that imply that only bed-bound, nonambulatory patients develop pressure ulcers. It is important to recognize that patients who are ambulatory can also develop pressure ulcers, although reduced mobility is still a major risk factor.

The purpose of this article is to familiarize physicians and other clinicians who provide care to hospitalized patients, such as physician assistants, certified nurse midwives, and nurse practitioners, with some of the terminology associated with pressure ulcers, so that they can better assess patients at risk for the development of pressure ulcers and properly identify and describe pressure ulcers.

Costs
For a sense of the total costs of the treatment of pressure ulcers, data from the 1990s, although old, can shed a light on current costs. In 1996, $6.4 billion was spent on pressure ulcers, which was 1.2% of total health care costs in the US. In 2006, excluding neonatal and maternal conditions, almost $11 billion was paid out for hospital stays in which pressure ulcer was either a primary or secondary diagnosis.

For the individual patient, the current costs of providing care for one pressure ulcer can range from $3500 to over $60,000, depending on the stage of the ulcer.

Pressure ulcers have also attracted the attention of the medicolegal community. Some courts regard pressure ulcers as evidence of elder abuse, and some lawsuits have awarded judgments of more than $10 million. If the presence of pressure ulcers is considered to indicate elder abuse, such legal judgments are not covered by conventional medical malpractice insurance policies, nor are such awards limited by the caps imposed by many US states in medical malpractice lawsuits.

In November 2008, the Center for Medicare and Medicaid Services instituted a policy to withhold reimbursement due to be made to acute-care hospitals for the costs of treating hospital-acquired conditions, such as pressure ulcers. Although hospitals will be paid for the care of pressure ulcers that originated before admission, hospital-acquired pressure ulcers would be the responsibility of the admitting hospital. Because of this change in policy, there is now an incentive for hospitals to accurately assess for skin problems in all patients being admitted and to identify all patients at risk for developing pressure ulcers so that preventive measures can be put in place. Increasingly physicians are being called on to identify at-risk patients and accurately classify skin conditions present at admission.

Identification and Risk Assessment
On admission to an acute-care hospital, all patients should undergo a thorough skin assessment to determine if they are being admitted with skin conditions, including pressure ulcers, that were already present. Any such condition must be clearly documented on the record of the admission physical examination. This documentation is
ultimately the responsibility of the admitting physician. In addition to performing a complete skin assessment, it is also important to identify the patient who may be at risk for developing a pressure ulcer after admission to the hospital. Such identification should then initiate interventions intended to maintain skin integrity and prevent skin breakdown. The most common assessment tool used for this purpose is the Braden scale,7,8 which evaluates the severity of several different factors that would place the patient at risk for the development of a pressure ulcer:

- Sensory: how well a patient can process sensory input from the skin as well as how effectively s/he can communicate level of sensation
- Moisture: to what degree the skin is exposed to moisture
- Activity: how active a patient is, irrespective of his or her degree of mobility
- Mobility: how well the patient can change and control his or her body position
- Nutrition: what constitutes the usual pattern and amount of caloric intake
- Friction and shear: how the patient moves within his or her confines.

Each of these factors is ranked on a numeric scale from 1 to 4, with the exception of friction and shear, which only has three points on its scale. Scores are then totaled. Ultimate risk is determined by the total Braden score, with the highest possible score being 23. Patients with scores of 18 or less are considered to be at varying degrees of risk. Individual hospitals will establish their own criteria for the specific levels of risk associated with the range of Braden score.

The performance of an assessment using the Braden scale is within the scope of practice of all registered nurses who have been educated to use the tool. Braden-scale assessments should be done on a regular basis, with the frequency determined by individual hospital policy, for all confined patients, as well as for patients who experience any change of condition, who have been transferred between different hospital units, or who have just returned from surgery. A physician should be able to ask for and to receive an up-to-date Braden score for any patient admitted to the hospital. The frequency of Braden-scale assessments should be at least every three days. Interventions can then be based on the specific deficiency identified by the assessment.

Patients who have problems with mobility will have to be physically turned by hospital staff on a regular basis. Repositioning frequency will be determined by the individual’s tissue tolerance, level of activity and mobility, general medical condition, the overall treatment objectives for the patient, and assessments of the individual’s skin condition.9 Patients with excess skin moisture will have to be treated with drying agents and compounds intended to protect exposed areas from maceration. Friction and shear can result in the disruption of capillaries and other small vessels, producing ischemia in subcutaneous tissues. When patients must move in bed, they must be lifted and repositioned, not slid across the mattress.

Nutritional deficits are common in many hospital-based patient populations and deserve special consideration. Protein supplementation is important, but there should be ongoing assessment with review of albumin and prealbumin levels. It can be useful to identify a patient at risk for nutritional deficiency by checking the initial serum albumin level. However, to assess for effectiveness of nutritional intervention, a prealbumin level, with a half-life of two days, is far more useful and will change during a period of days to one week with effective nutritional support.10

Using the Braden scale allows for a systematic approach to risk assessment and provides a road map that clinicians can use to efficiently manage the interventions intended to prevent the development of pressure ulcers.

**Staging**

When ulcers are identified in a hospitalized patient, it is essential to carefully document the circumstances that led to the formation of the ulcer, where the ulcer is, how

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**Figure 1. Pressure ulcer staging.**

Adapted and reprinted with permission from Auerbach PS. Wilderness medicine. 5th ed. Figure 13-3. Oxford (UK): Mosby; Copyright Elsevier, 2007.
large it is, and what stage it is. Different interventions and types of reimbursed procedures are required, depending on the stage of the ulcer. Only pressure ulcers can be staged. Ulcers that may have other causes, such as venous insufficiency, arterial occlusive disease, and diabetes mellitus, are not appropriate for the type of staging that is described here.

The stage of a pressure ulcer depends on the depth of the ulcer. Figure 1 shows the various stages of pressure ulcers by layer of skin or subcutaneous tissue involvement. The total surface area that the ulcer encompasses is not the determining factor. For example, a stage I or II pressure ulcer may have a fairly large surface area, but a stage III or IV may be of relatively smaller diameter but of greater depth. The development of pressure ulcers is a progressive process. If a patient has a lower-stage pressure ulcer and if preventive measures are not implemented to address the factors contributing to its development, then it will progress into a more complicated and severe ulcer.

In stage I ulcers, there is a change in the color, consistency, or temperature of the skin, but the skin is intact and the underlying tissues are unaffected. Figure 2 demonstrates a typical appearance; however, in some cases the skin may appear normal, and it is only by tactile examination that any changes in skin integrity can be identified. A stage I pressure ulcer is a warning sign that there is a problem. Interventions at this point can help prevent further, more problematic skin conditions.

Stage II pressure ulcers involve the epidermal layer of skin and may extend into the dermis as well. These usually appear as shallow, open areas or intact serum-filled or serosanguineous blisters. Although the skin is physically intact in a stage I pressure ulcer, a stage II pressure ulcer involves a break in the skin's integrity. Figure 3 depicts a typical example of a stage II pressure ulcer, with excoriation of the involved skin and extension into deeper tissues. When a patient develops a stage II pressure ulcer, it is common to have to contend with issues such as serous drainage that complicate skin care and can cause problems with adjacent areas of the skin that would not otherwise be affected.

Stage III pressure ulcers, such as the one seen in Figure 4, extend into the subcutaneous tissue, and although underlying bone, muscle, and fascia may be visible, the ulcer has no direct involvement of these structures. The presence of any necrotic slough in an ulcer that otherwise appears to be a stage II pressure ulcer automatically qualifies that ulcer to be a stage III ulcer. Stage III pressure ulcers may also involve tunneling and undermining, wherein the ulcer extends beneath normal tissue.

Stage IV pressure ulcers extend into bone or muscle, as is seen in Figure 5. Patients outside of acute-care hospitals with stage III and stage IV pressure ulcers qualify for Medicare Durable Medical Equipment coverage for more specialized mattresses and hospital beds.

Because staging is based on the depth of involvement, it is essential to be able to visualize the bottom of the ulcer. If the bottom of the
Pressure Ulcers: What Clinicians Need to Know

Ulcer is covered by thick eschar or adherent slough, then it cannot be staged and is referred to as unstageable. Only when the eschar is débrided and the base of the ulcer is fully visualized can the ulcer be accurately staged. An example of this is shown in Figure 6.

Another type of pressure ulcer that is difficult to stage is designated a deep tissue injury. The surface of the skin may appear to be like that of a stage I or II ulcer, as is shown in Figure 7, but the damage to underlying tissues is severe. Because the pressure forces are greatest at the interface between bone and surrounding soft tissue, tissues not visible may be severely compromised, even necrotic. Figure 8 shows how severe and how deep the damage can be to deep tissues. Areas of the skin with deep tissue injury can rapidly progress into deep stage III or IV ulcers, appearing to seemingly materialize overnight. The clinician’s index of suspicion regarding these ulcers must be high. A patient with what appears to be a large stage I or II pressure ulcer who also has a low Braden score may very well have deep tissue injury. In Europe, deep tissue injury and unstageable pressure ulcers are classified as stage IV. Whatever classification is used, these patients should be treated as if they have a stage III or IV pressure ulcer.

**Treatment**

Although it is only too easy to fall into the paradigm of watching pressure ulcers progress from stage I to stages III or IV, treatment must be rendered with the expectation of the ulcer healing from a stage III or IV to stage I and hopefully even back to more normal skin and tissue integrity.

The major principles of pressure ulcer treatment are as follows:

- Eliminating external pressure on affected area(s) of the body
- Preserving the integrity of surrounding normal skin and tissues
- Facilitating the body’s own mechanisms of natural healing
- Removing necrotic and devitalized tissue
- Providing adequate pain relief
- Reducing bacterial load
- Treating conditions that place the patient at risk for developing pressure ulcers, such as malnutrition and anemia.

It is beyond the scope of this article to review in detail the spectrum of treatment modalities available to treat pressure ulcers. The European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel have recently published a joint report on guidelines for treatment of pressure ulcers. Recommendations related to each of these principles are provided in that report, which can be accessed at www.npuap.org.

A 2008 review of treatment options that comprehensively surveyed the medical literature for all studies related to the treatment of pressure ulcers concluded, “Clinicians should make decisions regarding pressure ulcer therapy based on fundamental wound care principles, cost, ease of use, and patient preference.” A more practi-
The certificated wound-care specialists at the particular medical center in which they practice regarding what is available and what would be best to offer their patients with pressure ulcers.

**Conclusion**

Whether they were called bed sores or decubitus or some other even more archaic terms, pressure ulcers have been part of the spectrum of medical and nursing care since even before Florence Nightingale attended to the wounded soldiers of the Crimean War. For most of that time, our nursing colleagues might have thought that they had to contend by themselves with treating these conditions. It can be hoped that more involvement by physicians with the treatment of pressure ulcers will increase scientific study of the pathophysiology of pressure ulcers and effective treatment options. With such knowledge, it is possible that recommendations based on evidence can be made so that efficacy will improve and cost will decrease. Partnerships between physicians and nurses can help solve clinical problems by bringing fresh perspectives to the analysis process. The ultimate beneficiaries will be our patients, who depend on the collaboration of physicians and nurses to successfully address their personal health care needs.

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**References**


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**Exist**

And although our bodies are bounded with skin, and we can differentiate between outside and inside, they cannot exist except in a certain kind of natural environment.

— Alan Watts, 1915-1973, British philosopher and writer
“Mendocino”
photograph

By Nandini Bakshi, MD

Nandini Bakshi, MD, is a Neurologist at the Walnut Creek and Antioch Medical Centers and an Associate Clinical Professor at the University of California, Davis in CA.
Abstract

Background: Hyponatremia is a common electrolyte imbalance in hospitalized patients. It is associated with significant morbidity and mortality, especially if the underlying cause is incorrectly diagnosed and not treated appropriately. Often, the hospitalist is faced with a clinical dilemma when a patient presents with hyponatremia of an unclear etiology and with uncertain volume status. Syndrome of inappropriate antidiuretic hormone (SIADH) is frequently diagnosed in this clinical setting, but cerebral salt wasting (CSW) is an important diagnosis to consider.

Objective: We wanted to describe the diagnosis, treatment, and history of CSW to provide clinicians with a better understanding of the differential diagnosis for hyponatremia.

Conclusion: CSW is a process of extracellular volume depletion due to a tubular defect in sodium transport. Two postulated mechanisms for CSW are the excess secretion of natriuretic peptides and the loss of sympathetic stimulation to the kidney. Making the distinction between CSW and SIADH is important because the treatment for the two conditions is very different.

Case Presentation

A man, age 43 years, is evaluated for hyponatremia. He was admitted to the hospital six days earlier for an intracranial hemorrhage that required emergency evacuation. The patient was later extubated when his neurologic status improved. His medical history includes poorly controlled hypertension and rheumatoid arthritis.

On hospital day 6, his serum sodium level is noted to be 121 mEq/L. He has been receiving 0.9% normal saline since admission, and his sodium level has been gradually decreasing from 141 mEq/L, the level at admission. A hyponatremia workup reveals a low serum osmolality of 250 mOsm/kg, a normal serum creatinine level of 0.6 mg/dL, a urine sodium level of 89 mmol/L, and an inappropriately high urine osmolality of 588 mOsm/kg. His urinalysis reveals a specific gravity of 1.030, with no blood or protein. His levels of serum thyroid-stimulating hormone and random cortisol are within normal limits. His brain natriuretic peptide (BNP) and fractional excretion of uric acid are elevated, at 686 pg/mL and 83.8%, respectively.

The patient appears euvolemic, with a blood pressure of 115/70 mm Hg and pulse of 90 beats per minute. His intake and outtake documentation reveals that his urine output has been 2 to 4 L/d despite a fluid restriction of <1.5 L/d that was initiated two days earlier. His sodium level has continued to decline after the fluid restriction. The working diagnosis is syndrome of inappropriate antidiuretic hormone (SIADH).

Background

Hyponatremia (sodium level of <136 mEq/L) has been associated with confusion, lethargy, seizures, coma, and even death. The differential diagnosis for hyponatremia is broad and includes hormone disorders (eg, thyroid and adrenal insufficiency), medications, and volume-related problems. In the acute-care setting, hyponatremia has been reported to occur in up to 30% of patients with subarachnoid hemorrhage (SAH). The physician often faces a clinical dilemma when hyponatremia has an unclear etiology and volume status is uncertain. Early and accurate diagnosis of the etiology of the hyponatremia is important in order to institute proper therapy. An incorrect diagnosis can cause significant morbidity and mortality.

SIADH is a frequent diagnosis in a patient with hyponatremia and a concurrent intracranial process.
However, cerebral salt wasting (CSW) is an important diagnosis to consider and differentiate from SIADH.

CSW was first described by Peters et al in 1950 when they reported the cases of three patients with an intracranial process who exhibited renal salt wasting, but the existence of CSW was questioned after the identification of SIADH in 1957 by Schwartz et al. For years afterward, CSW was considered either a condition that was an element of SIADH or one that did not exist. CSW now is again being recognized as a separate entity altogether. A retrospective review of data for 316 patients who presented with SAH and hyponatremia found that the diagnosis was SIADH in 69% and was CSW in 6.5%. Both conditions have been reported to occur in the setting of head trauma, intracranial or metastatic neoplasm, carcinomatous or infectious meningitis, SAH, and central nervous system surgery. The distinction between these two conditions is important because their treatments are different.

**Diagnosis**

CSW and SIADH share many similar laboratory and clinical findings (Table 1). Both conditions present with low serum osmolality, high urine osmolality, and a high urine sodium level. The fundamental difference between the two processes is the extracellular fluid volume (ECFV) status. CSW is defined by the renal loss of salt with concomitant extracellular fluid loss. Consequently, patients with CSW have hypovolemia compared with patients with SIADH, who have euvolemic or mild ECFV expansion. The clinical history and assessment findings may be helpful if postural blood pressure changes, tachycardia, or poor skin turgor are present. Unfortunately, this difference is not always clinically apparent. In a study conducted by Chung et al to evaluate the clinical assessment of the ECFV status in 58 patients without edema and hyponatremia, only 47% of those with hypovolemia and 48% of those with euvolemia were accurately classified.

Uric acid excretion may be one measure for differentiating between CSW and SIADH. Initially, both conditions are associated with a low serum uric acid level and a high fractional excretion of uric acid. Uric acid is normally reabsorbed in the proximal tubule along with sodium. In SIADH, sodium resorption in the proximal tubule may be decreased because of an expanded ECFV, which can lead to less uric acid absorption and increased uric acid loss in the urine. Another contributing mechanism in SIADH, proposed by Decaux et al, involves the stimulation of the V1 receptor by antidiuretic hormone, which enhances excretion of uric acid in the renal tubules. The exact mechanism of uric acid loss in CSW has not been well defined. It is generally believed to be part of the solute diuresis that occurs in CSW with impaired urate transport in the proximal tubules. The key differentiation is that patients with SIADH have a serum uric acid level and fractional excretion of uric acid that normalize after correction of the serum sodium level, whereas the uric acid level remains low and uric acid excretion remains elevated in patients with CSW, despite correction of hyponatremia.

Response to fluid therapy is also a key distinction between SIADH and CSW. The treatment of choice for SIADH is free water restriction when increased fluid intake will worsen the hyponatremia. In contrast, CSW is a volume-depleted and sodium-wasting state requiring fluid

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<th>Table 1. Biochemical markers: comparison of SIADH and CSW</th>
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<td>Biochemical marker</td>
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<td>Extracellular fluid volume</td>
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<td>Urinary sodium level</td>
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<td>Serum uric acid level</td>
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<td>Initial fractional excretion of urate</td>
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<td>Fractional excretion of urate after correction</td>
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<td>Blood urea nitrogen/creatinine level</td>
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<td>Central venous pressure</td>
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<td>Pulmonary capillary wedge pressure</td>
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<td>Brain natriuretic peptide level</td>
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<td>Treatment</td>
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CSW = cerebral salt wasting; SIADH = syndrome of inappropriate antidiuretic hormone.
replacement with isotonic solutions. The renal wasting of sodium in CSW is poorly understood. Two postulated mechanisms are disruption of sympathetic neural input to the kidney and natriuresis induced by natriuretic peptides. Both mechanisms can lead to downstream inhibition of the renin-angiotensin-aldosterone system. Sympathetic stimulation normally causes proximal tubule absorption of sodium. Depression of this sympathetic input to the kidney results in less sodium resorption in the proximal tubule and an increase in sodium delivery to the distal tubule. This leads to a decrease in the effective arterial blood volume, triggering the baroreceptors to release antidiuretic hormone to help maintain intravascular volume. A depressed sympathetic drive has also been associated with a decrease in renin and aldosterone levels, further inhibiting sodium retention.

Elevated natriuretic peptides levels have been described with CSW. Atrial natriuretic peptide (ANP) and BNP have both been studied in patients with intracranial pathology and hyponatremia. Although both ANP and BNP have been described as elevated for up to two weeks, BNP elevation is more consistent. BNP is primarily released by the cardiac ventricles in response to the increased ECFV but can also be secreted by the brain. The natriuretic peptides have been described as causing direct tubular inhibition of sodium resorption and inhibition of intramedullary collecting-duct sodium absorption. They are also believed to cause direct inhibition of renin and aldosterone release from the juxtaglomerular cells and the adrenal gland, respectively.

Berendes et al studied BNP levels in patients with an intracranial process and compared them with study control participants. Sixty patients were divided into three groups. Group 1 included 10 patients with SAH who underwent clipping of ruptured aneurysms within 24 hours, group 2 included 10 patients with intracranial tumors who underwent craniotomy, and group 3 included 40 healthy individuals. Natriuretic peptides (ANP, BNP), aldosterone, renin, and antidiuretic hormone levels were assessed before surgery and at 1 hour, 4 hours, 12 hours, and daily for 7 days after surgery. Patients with SAH had elevated baseline BNP levels but normal ANP levels when compared with healthy individuals. Urine output and urinary excretion of sodium were greater in the SAH group than in the other groups. Aldosterone levels were also lower in this group. BNP appeared to be the primary natriuretic peptide that caused salt wasting in patients with SAH.

**Treatment**

Early appropriate therapy of hyponatremia is important to prevent complications. CSW is a volume-depleted state treated with intravenous administration of isotonic or hypertonic fluids to obtain positive fluid balance and correct volume depletion. Depending on the acuity and clinical manifestation of the hyponatremia, isotonic or hypertonic solutions would be indicated. Additionally, sodium tablets can be combined with the intravenous fluids. Doses of sodium of up to 12 g/d may be used. Rapid correction of the serum sodium by more than 12 mmol/d should be avoided because of the risk of osmotic demyelination.

Fludrocortisone, a potent mineralocorticoid, has also been used for the treatment of CSW at doses of 0.1 to 1 mg/d. It exerts its effects by stimulating reabsorption of sodium and water in the distal tubule, leading to expansion of the ECFV. When fludrocortisone therapy was used in patients with SAH, less natriuresis occurred and sodium balance was achieved more frequently. Thus, volume depletion and hyponatremia are preventable in patients treated with fludrocortisone. The most common adverse effect associated with fludrocortisone was hypokalemia, which was observed in up to 73% of patients.

The length of therapy depends on the clinical course of the hyponatremia and the underlying pathology associated with CSW (Table 2). Once the underlying pathology is corrected, CSW is usually a transient condition that resolves within three to four weeks. Hence, long-term therapy is usually not needed.

**Case Outcome**

The case presented here illustrates the dilemma that clinicians face. The patient’s condition did not respond to fluid restriction, although his laboratory test results and presentation appeared to suggest SIADH. However, the fact that his hyponatremia continued to worsen with fluid restriction raised

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<th>Table 2. Causes of cerebral salt wasting</th>
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<td>• Subarachnoid hemorrhage</td>
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<td>• Head trauma</td>
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<td>• Intracranial neoplasm</td>
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<td>• Metastatic neoplasm</td>
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<tr>
<td>• Infections or carcinomatous meningitis</td>
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<tr>
<td>• Encephalitis</td>
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<td>• Central nervous system surgery</td>
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some questions. In addition, his fractional excretion of uric acid was persistently elevated. The patient also continued to have a high urine output. He was immediately given isotonic saline, keeping his net fluid balance positive. The serum sodium level started to improve, but he continued to require 3 L to 4 L of isotonic saline daily to keep his fluid balance between even and positive. Although there is no absolute certainty in a diagnosis of a clinical syndrome, the patient’s condition was diagnosed as probable CSW. He was eventually discharged with a serum sodium level of 140 mEq/L.

Conclusion

Hyponatremia in the setting of a central nervous system event is a diagnostic challenge to physicians. Both SIADH and CSW are likely etiologies, as they present with very similar biochemical profiles. Levels of natriuretic peptides and changes in fractional excretion of uric acid may help differentiate between the two conditions. The key difference is that SIADH is a euvolemic to mildly hypervolemic state, whereas CSW is a volume-depleted state. Unfortunately, the volume status is not always clinically apparent in every patient. It is important to consider CSW in addition to SIADH in patients who present with hyponatremia and an intracranial process.

A correct and timely diagnosis is important in order to obtain a good outcome, because the two conditions are treated very differently.

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References

Chemistry

Chlorine is a deadly poison gas employed on European battlefields in World War I. Sodium is a corrosive metal, which burns upon contact with water. Together they make a placid and unpoisonous material, table salt. Why each of these substances has the properties it does is a subject called chemistry.

— Broca’s Brain, Carl Sagan, 1934-1996, American astronomer, astrophysicist, author, and cosmologist
“I’ve discovered the meaning of life, Bill!” the man sitting in my office exclaimed. His eyes saw worlds I could not imagine, and madness flickered in them like the light from distant stars. “The aliens told me! They told me, and it’s okay!”

John had informed me when he walked in that he had not taken his antimanic medication for six weeks because he knew he no longer needed it. I was rapidly assessing if he were a danger to himself or anyone else and trying to determine how I might contain him. Suddenly, he leaped to his feet.

“I’m a time–space pilot!” he shouted exuberantly. I must have flinched, because he immediately apologized and sat back down. “I didn’t mean to scare you, Bill, but it’s just so exciting!” He turned his attention back to me and riveted me with his gaze. Before I could react, he reached forward and grabbed my left hand, turned it palm up, and raised it to his eyes. He stared at it intently, as though the lines on my palm were the runes of some ancient and long-forgotten language that only he could translate.

“You’re my brother!” he shrieked. “We’re twins! I knew it! I knew you were special too!” He released my hand and drew closer, lowering his voice to a deep conspiratorial tone. “Bill,” he whispered. “Bill, will you be my time–space copilot?”

I was stunned. As I stumbled for words, he sat back in his chair with a broad smile on his face. I found myself thinking of the many sessions we had together. John had been a very successful businessman before the development of his acoustic neuroma and the surgery that went awry. His brain had suffered an insult from which it could not completely recover. He was not suicidal or homicidal, but those gross measures of behavior could not capture his personal tragedy. He was no longer the supremely competent man he had been. The six-figure income, the wheeling and dealing, the travel to exotic locales were gone.

His psychotic delusion gave meaning to what was a mere shell of his former life. Incorporating me into that delusion was the most precious gift he had to give me for my willingness to listen, to respect, and to challenge him.

“John, I’m flattered that you think of me so highly, that you would offer me such a privilege. But I really think you need to be on your medication again. You haven’t seen your psychiatrist for a couple of months. Would you mind if I brought her in?”

“Sure, Bill,” he answered, almost with relief. “I have to talk to her too. Bring her in.”

That incident happened at Kaiser Permanente (KP) Skyline Medical Offices in Salem, OR, in the late 1990s, and I have thought about it many times since. The patient’s name is not John, but his story is true. With a drink or two and the right audience, it can be a very funny story, an example of the M*A*S*H-type humor that most clinicians use at one time or another. At another level, it can be a very touching and troubling story, a striking example of how that most prominent organ of our humanity, the brain, can betray us so utterly. What kind of world is this that we inhabit, often so thoughtlessly? How thin is the ice of that “hard reality” that we skate on?

“Who Died and Left You King?”

When I think back over my 20 years at KP, the 35 years I have been a practicing therapist, and the thousands of patients I have seen, I am often reminded of an expression my mother used during my childhood. Whenever one of my sisters or I acted in an entitled fashion, she would retort, “Who died and left you king?”

So who appointed me as the one with the answers for the parents having trouble with their rebellious child? Or the young man or woman struggling with depression and thoughts of suicide? Or the elderly widow facing the end of her life without the support of her beloved spouse of 60 years?

William J Cook, MSW, LCSW, is a Mental Health Therapist at the Skyline Medical Office in Salem, OR. E-mail: bill.j.cook@kp.org.
I recall how salutary it was for me to finally have children of my own, after I had already worked for years in a child guidance clinic. Who knew that babies could really be so exhausting that you might have thoughts of just running away? Who knew that teenagers could really make you want to wring their necks (and enjoy doing it)? Who was I to tell parents how to handle their adolescents when I could not get my own to put the toilet paper roll on its dispenser or clean their dirty rooms? What kind of advice could I give when I could not prevent my own kids from using drugs or flunking school?

Just as oncologists get cancer and cardiologists have heart attacks, mental health therapists have “nervous breakdowns,” rebellious kids, and troubled marriages. Knowledge never insulates us from the human condition. Sharing that information with my patients has often been consoling to them when they have felt completely alone in their struggles.

Not so many years ago, if my memory serves me, a screen saver on the computers of KP Northwest read, “Remember that we are guests in our patients’ lives.” Nothing could be truer. My prayer for these three and a half decades has been that I never take for granted the enormous trust that people place in me when they walk through my door seeking my counsel. Of course, the enormous trust that people place in me when they walk through my door seeking my counsel.

There were sessions when she would storm into my office and demand, “Just shut up and listen!” After 20 or 25 minutes of ranting, she would stop abruptly, announce, “I’m done,” and leave. At other times, she would walk in, sit with her arms folded, and challenge me: “So tell me what to do if you’re so smart!”

We rehearsed social exchanges, practiced ways of meeting people, worked on decoding the feelings on other people’s faces, examined how to listen actively without feeling overly self-conscious. At times, she cried out her fears and frustrations, and her depression threatened to derail the whole process, but she began to grow. She started to take risks socially, tentatively reaching out to establish relationships with others like herself, bright but marginalized by the harsh caste system of high school.

Our work ended when her family moved to a large Midwestern city for her father’s job. They had made an exploratory visit first, and Edie came back into our last session with a cautious enthusiasm. “I think I like the city. The school is okay. I guess I’ll be all right. Maybe I’ll write, but don’t count on it.” She walked out of my office, but she’s never really walked out of my life.

Cases like hers and many others have given me ample opportunities to think about how psychotherapy works. As I write this, I am thinking of the film Up in the Air,\(^1\) starring George Clooney. Clooney is Rick Bingham, a “termination facilitator.” He is the hatchet man hired by companies to fire their unwanted employees. He never allows himself to think about the devastation he creates in the lives of the strangers he fires. In fact, in his spare time he conducts seminars aimed at helping people “unload their backpacks of useless baggage.” Relationships, he suggests, are just
such baggage, encumbering us, slowing us down, stifling our freedom. Unlike those of us in the audience, he is not privy to the brief cameos at the end of the film. All the terminated employees maintain that it was only their relationships—with spouse, partner, children, friends—that helped them survive that personal disaster and rebuild their lives.

Psychotherapy is primarily a relationship—a very special relationship. The old phrase we were taught in graduate school to describe that special relationship was unconditionaled positive regard. We hold our patients in high esteem. We respect them, no matter their crime or complaint. A tag line in the film Avatar is “I see you,” meaning “I see the person you really are.”

As a therapist, I am asked to see beneath the surface, deeper than the shame or the pain or the anger or the failure that may have gotten the patient into my office. After the seeing comes the doing.

The doing takes many shapes, some very specific and technical, some more amorphous and existential. For the woman who cannot manage to drive again after her motor vehicle accident, there will be a very detailed routine of graduated exposure to get her back behind the wheel. For the dissociative woman whose grandfather had fancied himself a vampire and, when she was a child of six and seven, would cut her and lick her blood, there will be grounding strategies to anchor her to the present and keep her from “going away” into altered states of consciousness. For the young veteran returning from the war in Iraq in the throes of posttraumatic stress disorder, there will be cognitive processing to reduce his trigger responses, and much support and validation to deal with the inanity of a civilian life apart from his warrior code. For the father of two who has just lost his job and his wife and is contemplating suicide, there will be a prescription of behaviors incompatible with staying depressed: a program of regular physical exercise; a safety net of family, friends, and emergency services; and weekly group treatment for support and accountability.

Often for patients like these, the use of psychotropic medications is an essential part of the doing of therapy. One of the distinct differences and unique pleasures of working at KP is that we have integrated medications and psychotherapy by working as a mental health team rather than as private practitioners. Psychiatrists and nurse practitioners work hand-in-hand with psychologists, clinical social workers, and professional counselors to provide a holistic approach to the mental health of our patients.

Because we have a clearer sense today of the indivisibility of mind and body, we recognize that brain chemistry alters the way we think, and the way we think alters brain chemistry. Medicines work directly on the brain chemistry, whereas psychotherapy works directly on the way we think. Separately and conjointly they effect the same goal—improving the well-being of our patients.

Perhaps the biopsychosocial model best captures this sense. We could even make the word entirely unwieldy and add the suffix spiritual to it to give due recognition to all the disparate avenues from which our suffering comes.

**Is the Buddha Laughing?**

Over the years, many people have asked me about burnout. “How do you manage to listen to people’s problems day in and day out without succumbing to them yourself?” they inquire.

All who participate directly with patient care—the primary care physician or physician’s assistant, the specialist, the nurse, the therapist, the medical assistant, or laboratory technician—must come to terms with the temptations of disillusionment, cynicism, and indifference. Yoda cautions to “Beware the dark side,” which for medical professionals can take many shapes: subtle or not-so-subtle annoyance with the patient who “refuses” to get better despite our best efforts; anger at the “entitled” patient whose demands seem to exceed our ability to respond; boredom with “run-of-the-mill” depression, attention-deficit hyperactivity disorder, or anxiety; seeing a diagnostic code instead of a person. The list goes on.

The real enemy is exhaustion, feeling pressured to see patient after patient by systems that may seem to care more about numbers than about people. This is nothing new to the 21st century. This battle has been fought by caregivers of all stripes and all times, because our altruism, generosity, and self-sacrifice make us vulnerable to exploitation. The only antidote is good self-care, the very tool we preach about to our patients.

I have often thought of Camus’ declaration from his plague-ravaged city: “There is more to admire in men than to despise.” I seek out that element—the aspect I admire—in each patient I treat and then I can rouse myself to empathy.

I have been blessed by my patients for more than I could ever thank them, more than I could ever return. In allowing me entry into their personal and private worlds, each has shared an incomparable gift of self. Often I have not been worthy of that gift, and for that I feel a sorrow that haunts my days. I have...
also been made to feel joy, and joy in abundance. It is the joy that comes from sharing the journey, deciphering another piece of the puzzle that is this life, affirming our common humanity in the face of every outrage and injury.

I have been supremely blessed.

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

Acknowledgment
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References

Sweet Oblivious Antidote
Canst thou not minister to a mind diseas’d
Pluck from the memory a rooted sorrow,
Raze out the written troubles of the brain,
And with some sweet oblivious antidote
Cleanse the stuff’s bosom of that perilous stuff
Which weighs upon the heart?

— Macbeth, Act V, Scene iii, William Shakespeare, 1564-1616,
English poet and playwright
The Case for Unit-Based Teams: A Model for Frontline Engagement and Performance Improvement

Paul M Cohen
Mark Ptaskiewicz, MD
Debra Mipos

Abstract

Unit-based teams (UBTs)—defined as natural work groups of physicians, managers, and frontline staff who work collaboratively to solve problems, improve performance, and enhance quality—were established by the 2005 national agreement between Kaiser Permanente (KP) and the Coalition of KP Unions. They use established performance-improvement techniques and employee-engagement principles (including social movement theory) to achieve clinical and operational goals. UBT members identify performance gaps and opportunities within their purview—issues they can address in the course of the day-to-day work, such as workflow or process improvement. By focusing on clear, agreed-on goals, UBTs encourage greater accountability and allow members to perform their full scope of work. UBTs are designed to deliver measurable benefits in clinical outcomes and operations, patient-experience enhancements, and physician-team performance or work life. For many physicians, UBTs will require new ways of engaging with their teams. However, evidence suggests that with organizational and physician support, these teams can achieve their goals. This article presents case examples of successful UBTs’ outcomes; physicians’ comments on their experience working with teams; an overview of UBTs’ employee-engagement principles; and advice on how physicians can support and participate in the work of such teams.

Early in 2008, the Internal Medicine team at the Kaiser Permanente (KP) facility in Strongsville, OH, lost three of its five clinicians. It was struggling to maintain access and patient flow, much less increase its focus on chronic-care management. Yet within six months, the team stepped up patient education, improved its workflow, and increased from 62% to 74% the number of diabetes patients with cholesterol levels under control, surpassing the Region’s goal. A medical-surgical unit at Fontana Medical Center, in Southern California, went 23 consecutive months, until January 2010, without an incidence of hospital-acquired pressure ulcers, after previously reporting seven to ten cases a year. Colorado’s regional laboratory improved the accuracy of its transfer and tracking records from 90% to 98%, significantly reducing rework and speeding turnaround times for patients’ laboratory test results. These outcomes, and hundreds of others across KP, were the result of performance-improvement projects undertaken by Unit-Based Teams (UBTs)—KP’s strategy for frontline engagement and collaboration (See Sidebar: About Unit-Based Teams).

Physician involvement in UBTs to date has varied and generally remains limited. However, in view of evidence from across KP, we believe that UBTs can help physicians achieve their clinical goals and improve their efficiency and thus deserve their broader involvement.

How Unit-Based Teams Work

UBTs apply their skills to better serve patients and address the needs of the unit, much as the best teams always have in the Permanente model of care. However, UBTs differ from most existing work units by:

- Identifying specific areas for improvement consistent with department or regional goals
- Using well-established performance-improvement techniques
- Measuring and assessing their results
- Having joint leadership by physicians, managers, and union workers.
The Case for Unit-Based Teams: A Model for Frontline Engagement and Performance Improvement

UBTs advance and align the work of the unit with the clinical and business goals of each Region. Teams identify performance gaps and opportunities within their purview—issues they can address in the course of the day-to-day work, such as workflow or process improvement. By focusing on clear, agreed-on goals, UBTs encourage greater accountability and allow team members to fulfill their full scope of practice or job description. Achieving agreed-on goals, in turn, promotes continuous learning, productive interaction, and the capacity to lead further meaningful change (See Sidebar: Principles of Employee Engagement).

As a strategy for process and quality improvement, UBTs draw on the study of “clinical microsystems,” advanced by Dartmouth-Hitchcock Medical Center and the Institute for Healthcare Improvement.\(^1,2\)

Four Key Benefits

The focused nature of UBT activities translates to four broad benefits to physicians and patients:

- **Clinical benefits:** Saving lives and improving health
- **Operational benefits:** Using resources wisely and improving efficiency
- **Member and patient benefits:** Providing a great patient-care experience
- **Physician-team benefits:** Improving team performance and work life.

The examples that follow show how UBTs in different Regions have delivered one or more of these benefits.

Clinical Outcomes: Controlling Hypertension

The Internal Medicine Department at Hill Road Medical Offices in Ventura, CA, faced a practical challenge: Patients with an initial elevated blood pressure reading

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**About Unit-Based Teams**

Unit-based teams (UBTs) were established by the 2005 national agreement between Kaiser Permanente (KP) and the Coalition of KP Unions. They are defined as natural work groups of physicians, managers, and frontline staff who work collaboratively to solve problems, improve performance, and enhance quality for measurable results.

Typically, a UBT comprises all members of a work unit or module. However, large groups—such as regional laboratories or call centers—may use a representative model, in which union-represented staff select their own delegates, often the shop steward. Most UBTs meet at least once a month to identify problems, review their progress, and plan future tests of change. Many teams meet more frequently in quick huddles. Physicians participate as needed.

UBTs are designated by regional and facility leaders and receive performance-improvement training and support. As of February 2010, more than 2600 UBTs representing more than 82,000 employees and physicians were operating across KP. The goal is for 100% of staff represented by the union coalition to be working in UBTs by the end of 2010.

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**As a strategy for process and quality improvement, UBTs draw on the study of “clinical microsystems,” advanced by Dartmouth-Hitchcock Medical Center and the Institute for Healthcare Improvement.**\(^1,2\)

**Figure 1. The Kaiser Permanente Values Compass.**

Most improvement projects fall under one or more points of the KP Value Compass, with the patient and member always at the center (Figure 1). Outcomes from teams across KP include the following:

- Increasing patient satisfaction as measured by patient-satisfaction survey scores
- Improving turnaround times for laboratory and diagnostic imaging results
- Eliminating unnecessary costs or waste
- Reducing patient wait times or delays
- Reducing process work-arounds, rework, and non-patient-driven variation
- Reducing workplace injuries, as measured by accepted Worker Compensation claims.

Information about UBT outcomes in specific KP Regions may be obtained by contacting the Labor Management Partnership coleads in specific Regions or facilities.

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**Clinical Outcomes:**

**Controlling Hypertension**

The Internal Medicine Department at Hill Road Medical Offices in Ventura, CA, faced a practical challenge: Patients with an initial elevated blood pressure reading
COMMEnTarY

The Case for Unit-Based Teams: A Model for Frontline Engagement and Performance Improvement

had to be retested after waiting at least two minutes—but they often left the office before the staff could do a second test. In fact, staff were doing needed second checks only 26% of the time as of March 2008.

Hill Road’s team brainstormed ways to do better. Their simple solution: a bright yellow sign reading, “Caution: Second blood pressure reading is required on this patient,” which employees hang on the examination-room door so that the physician or staff would be sure to do the test. “This was a ‘try-out mode,’” says Prakash Patel, MD, “and now the results are much better. The teams come up with good ideas about workflow because these are the folks in the trenches, and they see the headaches. They share ideas and work out processes that help.” In just one month, the department’s score on giving second blood pressure tests was 100%. The department’s score on the regional clinical goal of hypertension control went from 76% in August 2008 to 79.8% in May 2009, just below the regional goal of 80.1%. The team earned a Distinguished Accomplishment Award from the Region.

Operational Benefits: More Responsive Patient Service

Until recently, most staff at Colorado’s Telephonic Medicine Center were scheduled to work during the day, Monday through Friday—but 70% of the department’s calls came after 5 pm and on the weekends. Patient access and satisfaction was poor as a result.

By being flexible, putting the members’ needs first, and using their problem-solving training, the team devised solutions. They agreed that all the nurses—even the most senior—should work

Principles of Employee Engagement

Unit-based teams (UBTs) draw on well-established principles of performance improvement and employee engagement. Their use in health care settings is supported by the study of “clinical Microsystems” by Dartmouth-Hitchcock Medical Center, the Institute of Healthcare Innovation, and others.¹⁻³ In addition, exchange visits with the high-performing health care system of Jonkoping (Sweden), academic studies of workplace performance, and years of union experience mobilizing health care workers regarding workplace change all inform the theory and practice of UBTs at Kaiser Permanente (KP).

Impact of Engagement

Professor Jeffrey Pfeffer of the Stanford Graduate School of Business has reported that “[i]n hospitals, [the] benefits of collective bargaining clearly improve the quality of patient care ... [but] much of that gain disappears when labor–management relations become adversarial.”⁴

Thomas A Kochan, a labor economist and professor at MIT Sloan School of Management, has studied KP’s Labor Management Partnership from the beginning. He and his research team concluded that “UBTs open the organization to a variety of process innovations that can improve efficiency, quality, and patient satisfaction through changes to operational policies.”⁵⁻²⁰

In their assessment of 15 units in KP’s Northwest Region, the researchers compared units with different levels of employee involvement in Labor Management Partnership activities, determined from annual employee survey findings, and reviewed clinical outcomes in five areas: adult immunization, breast cancer screening, lipid screening, asthma monitoring, and child immunization. They found that all five clinical outcomes improved with more partnership involvement.⁶⁻⁹

High employee engagement translates to high performance in other ways as well. Studies by human resources consultants Watson Wyatt (now Towers Watson) have shown that highly engaged employees are twice as likely to be top performers, exceed performance expectations in three-quarters of cases, and more readily identify with the organization and its customers.⁶

Team-performance assessments at KP have found similar connections. “We’re still collecting the data, but in my experience, teams that have highly engaged workers and good team dynamics are twice as likely to be top performers,” says Paul Staley, Vice President, Operational Initiatives and Performance Improvement, Office of Labor Management Partnership. “They tend to score higher on performance metrics across the board.”

In addition, past studies found that employee attitudes about work were linked to members’ attitudes: Studies in Ohio, Georgia, and the Northwest showed that in locations where KP employees said they

Figure 2. Traditional change efforts. NHS = National Health Service.
COMMEnTarY

The Case for Unit-Based Teams: A Model for Frontline Engagement and Performance Improvement

one weekend shift or both weekend days every other week. The nurses were able to pick their shifts according to seniority. Average patient callback times on the weekends decreased from 37 to 17 minutes. Patient and employee satisfaction significantly improved as a result. For instance, the percentage of staff who said the department usually had enough people to do their job right increased from 29% to 65%. Full team engagement made the difference. “We just wanted to be able to express ourselves and be heard,” says Janet Jackson, RN. “Sometimes, that’s all it takes.”

Another Colorado UBT, in Skyline Medical Center’s Internal Medicine Department, developed a hypertension clinic to allow patients to be seen more quickly, without having to schedule a full appointment with a physician. Sean Riley, MD, coleader of the team, says of his involvement, “It’s benefited me and my patients, and it frees up some of my time to deal with different types of patient-care issues. It helps facilitate communication and understanding about what everybody’s role is in terms of running the clinic.”

Physician-Team Benefits, Member and Patient Benefits, and Operational Benefits: Improving Attendance, Safety, and Service

For years the Adult Medicine Department at Walnut Creek Medical Center in Northern California struggled to provide a great patient experience. Attendance was poor. The rate of workplace injuries was high. Patients were often roomed late, causing headaches for physicians and patients.

In 2007, department managers and union stewards resolved to

would recommend KP as a good place to get care, Health Plan members themselves were more likely to recommend KP to others or were more likely to give more favorable patient-satisfaction scores.7

What Drives Change

Helen Bevan, Director of Service Transformation, National Health Service (NHS) Institute for Innovation and Improvement, has used social movement theory to lead major performance and service improvements at NHS. Bevan has observed several characteristics of traditional workplace change efforts.8 Most change efforts she observed at NHS and elsewhere have focused on the upper right-hand quadrant of Figure 2—compelled effort, driven from outside (and usually above) the work unit. These are necessary elements, says Bevan, but not enough to change people’s attitudes, energy, and level of commitment. What is also necessary but often missing, she found, is an environment of internally driven, voluntary effort (Figure 3). “The health care revolution begins with each of us starting to think differently about our role as a leader in change,” says Bevan.

References


Figure 3. Transformation change efforts. NHS = National Health Service.
work together as a UBT—and the Department Chief, Helge Johannessen, MD, asked to be part of it. He suggested that a medical assistant assigned to each of the four stations in the unit select a physician with whom to identify problems and test solutions. “The physicians were happy to be involved,” says Dr Johannessen.

To help room patients on time, staff started and ended their lunch break ten minutes earlier. The change was piloted at one station at a time, to give others a chance to assess results and buy in. In addition, the team developed a proposal to reconfigure the floor plan, consolidate member check-ins at one station, and provide more flexibility. To improve attendance, staff agreed on schedules and ensured that time-off requests were covered. Sick days dropped from more than nine days per full-time employee in 2007 to 7.35 days per year in 2008—well below the regional target. The team ended 2009 with just 2.8 days of sick time per full-time equivalent, no missed meals or breaks, and no workplace injuries. New scheduling processes also allowed the unit to book patient appointments sooner. Member and patient satisfaction scores have increased along with team performance.

“The UBT worked much better than I expected,” says Dr Johannessen. “There’s more of a give-and-take, and we can better see the big picture.” He adds that working with the UBT has helped him achieve department goals and has given other physicians new leadership experience. “We get better solutions and more support from the people who can ensure that changes we discuss actually happen.”

**How Physicians Can Lead**

For many physicians, UBTs will require new ways of engaging with their teams. UBTs may at first struggle with how to be productive and where to focus their efforts (See Sidebar: How to Choose an Improvement Project). But some things will not change:

- Physicians still set the tone and lead by example; staff will model their behavior after physicians
- Physicians are still responsible for leading the team and making the clinical and quality decisions. The team will work with the physician to make decisions on work flows to support the care experience and outcomes for patients and patients’ families.
- It may take time for teams to become proficient in problem-solving techniques, just as it takes time to master a new clinical technique or procedure. Strong team leadership helps speed the transition from dwelling on process (how to make decisions and handle disagreements) to getting results for patients and enhancing the work experience for staff, managers, and physicians.

UBTs are taking hold at the right moment for KP. Clinicians are under pressure to contain costs, maintain quality, and improve service, and UBTs have the problem-solving tools to address those issues. Furthermore, research shows that when physicians and patients communicate well, patients are more likely to adhere to therapeutic regimens, are more satisfied with office visits, and have better outcomes. Additional research shows that when members of the support staff feel respected and valued by the physician, patients have better perceptions of the physician.

Physicians can do many things to support and benefit from the work of their teams: listen openly to the comments and suggestions of nonphysicians; give feedback in a spirit of mutual respect, collaboration, and learning; participate in UBT huddles and improvement efforts; and recognize team members’ contributions.

**How to Choose a Performance-Improvement Project with Your Team**

As unit-based teams (UBTs) spread across Kaiser Permanente, physicians can do several things to support their development and reap the benefits. One key to getting a high return from the time invested in a UBT is to select appropriate performance-improvement projects. An effective effort should be:

- Something everyone cares about and demonstrably improves patient care, service, or affordability
- Consistent with the regional or medical center priorities (eg, better control of hypertension or diabetes, better service scores)
- Within the scope of the unit—something the unit can do without another unit’s cooperation
- Small enough to achieve in a reasonable time frame—but important enough to be interesting and relevant
- Measurable, preferably using data you already have or can readily collect
- Helpful to the team and its relationships, building the capacity to take initiative, be creative, and put patients first.
“I strongly encourage all chiefs of service to champion the unit-based team in their department by either active participation or as a physician advisor, particularly regarding quality, service, and access initiatives,” says Virginia L Ambrosini, MD, Assistant Executive Medical Director, Permanente Human Resources, Southern California Permanente Medical Group.

The best UBTs make demands on all members of the team, including physicians. However, as UBTs grow in number and proficiency, so does the evidence base: UBTs are getting measurable results, improving care and service to KP patients, and strengthening the KP model of care.

A 30-minute physician training program on UBTs (“Orientation to Unit-Based Teams Web-based Training for Physicians”) is available online at KP Learn (http://learn.kp.org/ [registration required]).

The Rapid Improvement Model, based on a framework developed by Associates in Process Improvement and popularized by the Institute for Healthcare Improvement, uses iterative cycles of “plan, do, study, act” to conduct small tests of change.

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Acknowledgments
The authors thank Janet Coffman for her contributions to this article—and salute the thousands of KP workers, managers, and physicians who have contributed to the success of unit-based teams. Katharine O’Moore-Klopf, ELS, of KOK Edit provided editorial assistance.

References

Play Together
The way a team plays as a whole determines its success.
You may have the greatest bunch of individual stars in the world, but if they don’t play together, the club won’t be worth a dime.

— Babe Ruth, 1895-1948, American baseball player
Chocolates

Lynette Vialet, MD

Yesterday, she brought me a gift: chocolates—artisan chocolates, individually wrapped by hand in delicate foil, boxed in bronze satin paper, and tied elaborately with gold ribbon. I had not expected anything. Rather, I feared the repercussions of bad news given unexpectedly.

I had not seen her for over a year. Not since the day I said, “You need a mammogram and follow-up for this.” I did not give voice to my suspicions, but perhaps she felt something in my words, in my voice: caution, warning, or fear.

That particular day, she was 1 of 20 patients on my schedule—1 of 20 women who had come in for a routine Gyn exam or a problem or questions. I should have known. I know the numbers. I can recite them. One in 9 woman will have a breast lump that, as much as we all hope and pray and wish, will not be benign.

She handed me the box, glimmering bronze and gold, and smiled with tears in her eyes. “Thank you,” she said. “You found it, otherwise it would have been a long time before something was done about it.”

For her, something being done about it included surgery, followed by radiation, followed by chemotherapy, her hair falling out, and finally the recovery, the fear, the “what if?” Why thank me for that? But I thanked her back, told her she shouldn’t have and the other niceties we all say when we are given something we know we don’t deserve.

I resolved to savor each tiny morsel of delectable, smooth chocolate. I picked an elaborately decorated chocolate square, bit into the sweet coating, dark and rich. As I chewed I suddenly felt a crack, a tiny nut of hardness. I remembered her exam, and many others like it: the same smooth tissue soft, pliable, until all of a sudden there is that startling stone, a hard bit, randomly placed. But this chocolate, this time, rather than be surprised, I will bite down, press hard with my teeth, hit that edible pebble and know that the chocolate will never be the same, for I did not deserve such sweet perfection.

Love

All I really need is love,
but a little chocolate now and then doesn’t hurt!

— Charles M Schulz, 1922-2000, American cartoonist

Lynette Vialet, MD, is an Ob/Gyn in the Colorado Permanente Medical Group in Denver, CO. E-mail: lynetteviolet@hotmail.com.
BOOK REVIEW

The Healing Of America: A Global Quest for Better, Cheaper, and Fairer Health Care
by TR Reid

Though much has been written, few people are aware of US standings in international health care rankings: 31st in life expectancy, 37th in infant mortality, 34th in maternal mortality. A child in the US is two and a half times as likely to die by age five as in Singapore or Sweden. We spend more of our GDP (17% and rising) than any other country, and get much less than most first-world countries, who spend considerably less.

In The Healing of America, TR Reid takes us on a journey using the ingenious approach of offering his previously injured shoulder to comparatively assess several systems of health care.

In the US, he is offered expensive joint replacement with the potential risks of major surgery. In France and Germany, physical therapy is recommended; however, the same surgery, at low cost, is available. In England, he is given the advice to live with it: his predicament is not a priority. In Japan, traditional Chinese medicine, physical therapy, steroid injections, or surgery are offered at little cost. In India, he obtains significant relief with meditation, herbs, and massage.

Mr Reid posits most countries use one of four models: 1) the Bismarck model in Germany, Japan, France, Belgium, and Switzerland consists of private clinicians and insurers financed through payroll deductions overseen by the government; 2) Britain’s Beveridge model is government-financed through taxes with government-owned hospitals and government-regulated physician payments, decried in the US as “socialized medicine”—Italy, Spain, and most Scandinavian countries follow this model; 3) in Canada, through taxes, the government funds single payer, or National Health Insurance; with private physicians and hospitals—Taiwan and South Korea have adopted this system; 4) the final model, appropriately called Out-of-Pocket, is found primarily in poor nations where only the rich get health care.

In the US, an amalgam of all four models prevails. Employer-based health insurance reflects the Bismarck model. The Veterans Administration is similar to the Beveridge model. Medicare, often criticized but ferociously defended, reflects the Canadian model. Our 45 million uninsured and the self-employed reflect the Out-of-Pocket system.

Mr Reid effectively illustrates the difference between our system of care and those of the nations he surveys. In the US, our patchwork of multiple alternatives, the most expensive in the world, omits care for 15% of the population. And yet, with stellar insurance or financial means, an American has access to some of the best available treatment and most advanced technological diagnostic equipment in the world.

Our Achilles’ heel lies in our system of payment for volume services rather than for value. Physicians overprovide lest they be sued for not doing more. Thus, we spend 65% to 85% of the premium dollar on medical care, referred to as “medical loss.”

Mr Reid clearly shows that the dominant theme in other countries is universal health care, where access is a national right and the choice of system reflects the ethics and values of that society. That is a bridge the US has yet to cross; we remain subject to a system in which 45,000 people die each year for lack of insurance—one person every 12 minutes—and 700,000 people face bankruptcy because of medical bills.

Ultimately however, physicians must assume some responsibility for the current state of affairs. The American public has been led to believe more care is always better. Thus any reform geared toward judicious use of cost-effective, evidence-based care is pilloried as rationing, notwithstanding that we already ration care based on wealth status.

Even with the passage of the 2010 Health Care Reform bill, until we change the mindset of Americans, costs will continue to spiral upwards. TR Reid’s book is a welcome step along the road to rational change in our health care environment.

References

KM Tan, MD, is the retired former Chief of Radiology at Kaiser Permanente in San Rafael, CA and is former Chair of the National Imaging Core Group. He is a member of the Editorial Team for TPJ and has served in multiple state and national positions in CME, and continues on the KP National CME Committee. E-mail: kmtan@comcast.net.
Recently I read, *Waiting for Wings: A Woman’s Metamorphosis through Cancer*, by Heidi Marble. Through the pages of this phenomenal book, I found described all the patients that I have known in my career.

Ms Marble’s narrative, poetry, and the book’s photography tell the story of how she found the light of life through the darkness of cancer. Beginning at the time of the diagnosis of inflammatory breast cancer, the author chronicles her life. Initially, she intended to use her poetry and the photos describing her emotions and experiences with cancer to leave a journal for her husband, son, and family after she passed on. However, as she began to heal, she began to see herself as a butterfly coming out of a cocoon, and she has metamorphosed as a type of healer to other women with breast cancer. I was entranced as I read her poetry, which conveys not only her thoughts and feelings but also those of women I have known who have dealt with breast cancer. The amazing photos by Cordetta Spells resonate and well represent Ms Marble’s butterfly symbolism.

As a women’s health Ob/Gyn Nurse Practitioner and Nurse Midwife for more than 28 years, I have never found an “easy” way to convey the “C” (cancer) word to any patient. I have tried to be matter of fact and clinical, but somehow it always gets messed up and I get emotional on some level. I incorporate a holistic approach along with that of the allopathic medicine when working with clients. I have prayed with patients, checked up on others with phone calls or cards (or both) to offer encouragement, or I have even been known to make my famous “Organic Chicken Soup” for one patient who could barely keep anything down by the time she was working on her ninth diagnosis of breast cancer.

Ms Marble’s account of her experience expresses the heart and soul of our clients who look to us to guide them on a journey of emotions, which includes loss, suffering, and redefining who they are. Clinicians often prefer to avoid these emotions, or they can’t yet face these kinds of emotions especially during a busy clinic. Yet, it can mean so much for patients to have clinicians that they can lean on during this time of need. The foreword, written by James Long, MD, emphasizes the importance of compassion when mixed with truth and reminds us to include honest hope when working with cancer patients.

The lives of families are also transformed by their loved one’s cancer and the various surgeries and treatments. The collection of letters written by family and friends shows us that we are not just treating the patient but those who also are important connections to our patients. It points out the importance of having a support group that one can lean on and gain strength from. I sometimes wonder how this can be provided for those in our mobile society who are living miles away from family or for those who are not financially well off?

The roller coaster ride for Heidi started from the time of her diagnosis, chemotherapy, and hair loss. Through the emotional and physical pain, her roller coaster went up and down, gaining speed or sometimes jolting her off guard with her hysterectomy, thoughts of suicide, then determination to live on hearing her son’s voice; only to be overwhelmed, in the next moment, with drugs, procedures, and pain. Once the cancer roller coaster ride slows down to idle (it must take patients a long time to feel that cancer is gone) and the rider jumps off (or, as the author describes, breaks out of the cocoon), patients have a new perspective on life, and some even reach out and fly to help others as Ms Marble has done.

I recommend this book for all who want to know more about dealing with cancer on a basic human level. It opens your eyes and your heart.
CME Evaluation Program

Kaiser Permanente physicians (NUID required) 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 30, 2010. Forms may also be completed and submitted online at: www.permanentejournal.org. You must complete all sections to receive credit. (Completed forms will be accepted until September 2011. Acknowledgment will be mailed within two months after receipt of form.)

Section A.

Article 1. (page 11)
Risk of Proximal Colonic Neoplasms in Asymptomatic Adults Older Than 50 Years Found to Have Distal Hyperplastic Polyps On Routine Colorectal Cancer Screening

All of the following are advocated and accepted methods or modalities for colorectal cancer screening in the asymptomatic population except:

a. computed tomography colonography starting at age 50
b. yearly stool for occult blood starting at age 50
c. air contrast barium enema (ACBE) of the large bowel starting at age 50
d. yearly digital rectal exams (DRE) starting at age 50
e. colonoscopy starting at age 50

The two new novel risk factors identified in this study that may help predict proximal lesions in the colon in those with or without distal hyperplastic polyps include:

a. having an elevated body mass index and a prior history of an appendectomy
b. being a nonsmoker and current use of nonsteroidal anti-inflammatory drugs
c. estrogen use in females and a prior history of cancer (other than colorectal cancer)
d. the actual size and number of the distal hyperplastic polyp(s)

Article 2. (page 35)
Clostridium difficile Infections: What Every Clinician Should Know

If a patient with documented Clostridium difficile infection is no longer able to tolerate oral feeding due to excessive nausea and vomiting and a nasogastric tube cannot be placed, what is a valid treatment option?

a. intravenous cefazolin sodium
b. intravenous ampicillin and sulbactam (Unasyn)
c. intravenous metronidazole and vancomycin per rectum
d. intravenous vancomycin

Which patient is most concerning for a Clostridium difficile infection?

a. a Caucasian boy, age eight years, with failure to thrive and celiac sprue disease who presents with watery diarrhea
b. a Caucasian woman, age 78 years, who has been residing in a nursing home for the past four months who has sudden onset of profuse, watery diarrhea and dehydration
c. a Caucasian man, age 28 years, with Crohn’s Disease who presents with bloody diarrhea
d. a Latina woman, age 46 years, whose fecal leukocytes return positive

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.
Section B. Referring to the CME articles and the stated objectives, please choose your level of agreement next to each statement as appropriate.

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

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