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The Permanente Journal

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On the cover: "At Angelique" (24"x 30") by Fred M Freedman, MD, is an oil on canvas of a Paris café scene. It is painted from a photo Dr Freedman shot at Angelique, a café in Paris known for its hot chocolate and dessert pastries. The photograph was taken from a balcony overlooking the front window tables. In this painting, Dr Freedman wanted to try a loose painting style with a post-impressionistic color spectrum.

Dr Freedman is a Neurologist at the South Bay Medical Center. He enjoys painting in oil on canvas and the inspiration for many of his paintings are scenes from his travels. Dr Freedman has done artwork all his life, including painting in oil and gouache and etchings. He is retiring in September and hopes to be able to pursue more travel, photography, and art—all linked together as in this painting.

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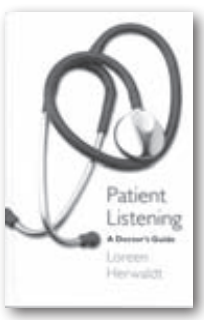

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ORIGINAL ARTICLE

Associations of Psoriatic Arthritis and Cardiovascular Conditions in a Large Population

Svetlana Kondratiouk, DO
Natalia Udaltsova, PhD
Arthur L Klatsky, MD

Abstract

Purpose: We studied the hypothesis that possibly via shared inflammatory mechanisms, psoriatic arthritis (PsA) is associated with increased prevalence of cardiovascular (CV) conditions.

Methods: Among a multiethnic population of 76,465 men and women with known demographics, we studied all persons (n = 99) with confirmed outpatient diagnoses of PsA. Associations of PsA with CV diagnoses were studied in the entire population by logistic regression with six covariates. With two matched control study subjects for each study subject with PsA, selected risk traits for CV conditions at time of PsA diagnosis were compared with findings on *t*-tests.

Results: Study subjects with PsA did not exhibit more atherothrombotic disease (coronary and cerebrovascular) or diabetes mellitus but had increased prevalence of systemic hypertension and heart failure compared with study control subjects. In the case-control analysis, study subjects with PsA had a lower mean blood cholesterol, a higher mean body mass index, and a higher mean blood pressure compared with study control subjects; mean blood glucose was similar in both groups.

Conclusions: In this analysis the associations of PsA with CV risk factors and CV conditions are mixed. Except for increased systemic hypertension, it is unclear whether PsA is related to higher prevalence of CV disease.

Introduction

Psoriasis is a common inflammatory skin condition with an extensive medical literature.[1,2] Although less common, psoriatic arthritis (PsA) has also been studied substantially,[1,3–6] but there are only limited data about PsA from population-based studies. Available reports suggest relations of both psoriasis[7,8] and PsA[9,10] to atherothrombotic cardiovascular diseases (CV), but some studies are limited by small numbers of participants, self-report of diagnoses, and homogeneity of study populations.

We present here the results of a study of PsA in a large, multiethnic, free-living population. We hypothesized that PsA and atherothrombotic vascular conditions might be associated because of shared underlying inflammatory mechanisms. Thus, we examined associated diagnoses made by physicians. A matched case-control analysis yielded data about selected traits usually considered risk factors for CV disease. Because study subjects with PsA were determined from among persons with known computer-stored previous data, in the case-control analyses it was possible to also study changes in the CV risk traits.

Materials and Methods

Study Population

The study protocols were approved by the institutional review board of the Kaiser Permanente Medical Care Program. The study population consisted of 76,425 persons who, on January 1, 1995, were members of a comprehensive prepaid Northern California Health Plan and whose demographic traits were known from previous health examinations[11] for the period 1978–1985. These persons are thought to represent a cross-section of Health Plan members and were classified as follows: 43% men, 52% white, 30% African American, 11% Asian American, and 5% Hispanic. The Health Plan members reflect the full socioeconomic spectrum of the general population except for the extremes of income.

Study Subjects with Psoriatic Arthritis

The date for study population selection was based on the fact



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that outpatient diagnoses at visits to Health Plan facilities was first stored in computers in January 1995. We searched these computer files for diagnoses of PsA (*International Classification of Diseases,* 9th revision [ICD-9] code 696.0) through 2004, identifying 120 individuals (0.16%) with a diagnosis of PsA. A physician investigator performed a detailed record review of the 120 possible study subjects with PsA for confirmation of diagnosis. Strong consideration was given to acceptance of the PsA diagnosis if it was made by a rheumatologist, but inclusion ultimately depended on a compelling clinical picture, including radiologic evidence of erosive disease and negative findings on tests for rheumatoid factor. Uncertain diagnoses were resolved by consensus. We excluded 21 study subjects from analysis either because they did not fulfill PsA criteria established for this study or because other (than PsA) rheumatologic diagnoses were judged more likely. Thus, there were 99 confirmed study subjects with PsA in the analyses (0.13% of study subjects); of these, 50% were men, 70% were white, 8% were African American, 16% were Asian American, and 2% were Hispanic.

Analysis of Coexistent Outpatient Conditions

These associations were studied by logistic regression in all 76,425 persons. Included were the following CV conditions (ICD-9 codes): systemic hypertension (400–405), coronary heart disease (410–414), heart failure (428), cerebrovascular disease (430–438), and diabetes mellitus (250). Diabetes was included because from the risk viewpoint, it is widely considered a "coronary disease equivalent." Age-adjusted and multivariate logistic models used covariate data obtained from the 1978–1985 health examinations, including self-classified ethnicity, education, marital status, body mass index (BMI), cigarette smoking status, and alcohol intake. These models yielded odds ratios (ORs) for relations of PsA to each coexistent condition, 95% confidence intervals (CIs), and P values. For this study, we defined "statistical significance" as $p < 0.05$.

Record Review and Case-Control Study Subjects

In addition to confirmation of PsA diagnosis, chart review included abstraction of data about weight, blood pressure, total cholesterol, and blood sugar at the time of diagnosis. For each confirmed study subject with PsA, two study control subjects were selected who were Health Plan patients at the time of first outpatient PsA diagnosis but who were free of diagnosed PsA, psoriasis, and other rheumatic inflammatory conditions (rheumatoid arthritis, lupus erythematosus, scleroderma, dermatomyositis, and polyarteritis nodosa). Each study control subject was matched to the corresponding study subject with PsA for age, sex, and ethnicity. Data similar to those for study subjects with PsA were abstracted for these study control subjects, using date for study control subjects closest to corresponding study subjects with PsA.

Case-Control Comparisons

The matched groups (study subjects with PsA vs study control subjects) were compared with student's *t*-test, with results expressed as χ-square and p values. In this manner, we examined traits at time of PsA diagnosis, data from the earlier examinations, and changes in the measurements between the earlier examinations and date of diagnosis.

Results

Outpatient Diagnoses Associated with Psoriatic Arthritis

These associations are presented in Table 1. There was increased prevalence of systemic hypertension and of heart failure among the study subjects with PsA. In contrast, although the p values were >0.05 for each, the ORs for associated coronary disease, cerebrovascular

Similar mediators are involved in the genesis of atherosclerosis, atherothrombotic diseases, the group of traits known as metabolic syndrome, and systemic hypertension.[13,14]

Table 1. Associations[a] of outpatient diagnoses[b] with psoriatic arthritis

ICD-9 code (number of study subjects with psoriatic arthritis)	Odds ratio	95% confidence interval	p value
Systemic hypertension (38,461)[b]			
Codes 400–404 (48)	2.1	1.3–3.2	0.001
Coronary heart disease 10,123)[b]			
Codes 410–414 (13)	0.7	0.4–1.3	0.3
Heart failure (5809)[b]			
Code 428 (11)	2.0	1.0–3.8	0.04
Cerebrovascular disease (7969)[b]			
Codes 430–439 (5)	0.8	0.4–1.3	0.5
Diabetes mellitus (12,206)[b]			
Code 250 (10)	0.7	0.4–1.7	0.5

[a]Versus study control subjects without psoriatic arthritis, by logistic regression, among 76,425 persons. Covariates in models were age, sex, race/ethnicity, education level, body mass index, smoking status, and alcohol intake, determined at 1978–1985 examinations.
[b]Outpatient diagnoses 1995–2004.

Table 2. Relations of covariates and other traits[a] to psoriatic arthritis

Trait (referent)	Odds ratio[a] (95% confidence interval)
Age (× 10 years)[b]	0.9 (0.8–1.1)
Sex (female/male)	0.7 (0.5–1.1
Ethnicity black (white)	0.2 (0.1–0.4)[c]
Ethnicity Asian (white)	1.1 (0.6—2.1)
College graduate (no college)	1.3 (0.6–2.8)
Alcohol 1–2 drinks per day (never)	0.8 (0.4–1.7)
Smoke >1 pack per day (never a smoker)	1.3 (0.6–2.8)
BMI 25–30 kg/m^2 (<25 kg/m^2)	0.9 (0.5–1.3)
BMI >30 kg/m^2 (<25 kg/m^2)	1.7 (0.9–3.3)
BP >140/90 mm Hg (<120/80 mm Hg)	1.1 (0.6–2.0)
Total blood cholesterol (× 10 mg/dL)[b]	0.92 (0.87–0.97)[d]
Blood glucose (× 10 mg/dL)[b]	0.9 (0.8–1.0)
Leukocyte count (× 1000/mm^3)[b]	0.9 (0.9–1.1)

[a] Odds ratios for 1978–1985 examination traits in relation to 1995–2004 diagnoses, by logistic regression; models include age, sex, race/ethnicity, marital status, smoking status, alcohol intake.
[b] Continuous variable.
[c] $p < 0.001$.
[d] $p < 0.01$.
BMI = body mass index; BP = blood pressure.

disease, and diabetes mellitus were <1.0. Several of the relations of the covariates are presented in Table 2. Age and sex were unrelated to likelihood of the diagnosis of PsA. African Americans had a lower PsA prevalence, but there was no difference between Asian Americans, largely of Chinese or Filipino ethnicity, and whites. Total blood cholesterol level was inversely related to PsA. Unrelated traits included education level, obesity, heavy smoking, daily moderate alcohol drinking, BMI, blood pressure, blood glucose level, and leukocyte count.

Comparisons of Study Subjects with Psoriatic Arthritis and Matched Study Control Subjects

Case-control comparisons for selected CV risk traits are shown in Table 3. Mean cholesterol levels were lower in study subjects with PsA than in study control subjects both at the earlier examinations in 1978–1985 and at date of diagnosis. There were decreases in mean cholesterol levels from the earlier to the later measures, slightly greater in the study subjects with PsA. The study subjects with PsA had a higher mean BMI both in 1978–1985 and at diagnosis, but the increase in BMI over time was similar in both groups. Mean systolic and diastolic blood pressure was similar in 1978–1985 for study subjects with PsA and study control subjects but increased more in the study subjects with PsA, resulting in significant case-control differences at time of diagnosis. Blood glucose levels were similar in cases and study control subjects at both measurements, and they increased to a similar extent over time.

Discussion

Although the etiology of most rheumatic conditions is not well established, it is accepted that autoimmune phenomena and chronic tissue inflammation are involved and possibly causal.[9,12] The same is true for psoriasis, a T-helper-cell type 1 immunologic inflammatory skin disease[7] and, presumably, for PsA, now classified as one of the spondyloarthritides.[6] In general, T-cell activation induces proinflammatory cytokines and chemokines that are noxious to a variety of tissues. Similar mediators are involved in the genesis of atherosclerosis, atherothrombotic diseases, the group of traits known as metabolic syndrome, and systemic hypertension.[13,14] Epidemiologic studies show that atherosclerosis has a number of causal risk factors, several of which (cigarette smoking, atherogenic lipids, hypertension, and hyperglycemia) involve cytokines, other bioactive substances, and cells characteristic of the inflammatory process. In fact, endovascular inflammation is now considered involved in all stages of atherosclerosis development and may well be causal.[13,14] Despite the apparent similarities in hypothetical noxious biologic pathways related to inflammation, the link between rheumatic conditions and atherosclerosis remains a statistical association without established causal mechanisms.

We found inconsistent positive associations of CV conditions with PsA. Although hypertension and heart failure were associated, atherothrombotic disease was not. Even though this could be interpreted as indicating a lesser role for common systemic inflammatory mechanisms than we expected, inflammation is not the only possible mechanism for a link among atherosclerosis, PsA, and rheumatic conditions.[8] Shared CV risk factors would be another possible basis for a link. Our data show inconsistent evidence about shared risk traits also, but we did not have data about several important potential CV risk traits. Several of these, such as amount physical activity and diet,

might be modulated by the presence of PsA. Increased CV disease as a consequence of treatment is another interesting possibility. For example, use of nonsteroidal anti-inflammatory medications might increase risk of hypertension or of heart failure, the specific conditions we found related to PsA. Finally, shared genetic predilections are hypothetically possible, but our data cannot evaluate this aspect.

In the case-control comparison, weight gain was similar for study subjects with PsA and study control subjects. The greater increase in blood pressure in study subjects with PsA could be substantially responsible for the heart failure disparity, especially because coronary disease, another major risk factor for heart failure, was not more prevalent in the study subjects with PsA. Although this was not a strictly prospective analysis, it is noteworthy that there were no convincing relations to the 1978–1985 examination data about blood pressure, blood glucose levels, or leukocyte count. The unexplained inverse relation of total blood cholesterol in 1978–1985 to PsA might partially account for the absence of a relation of PsA to atherothrombotic disease. Leukocyte count, a marker of inflammation, was unrelated to PsA but has previously been reported to be related to acute myocardial infarction in this population.[15]

Not surprisingly, our data do show that the known relatively low prevalence of psoriasis in African Americans[2] extends to PsA. Also, the data show that Asian Americans have rates of PsA similar to those of whites.

Limitations of our study start with the fact that the small number of study subjects with PsA precluded the statistical power to demonstrate modest relations to the condition. Another limitation was our inability to study temporal relations and thus incident disease. We emphasize that this was not a prospective analysis. This should not affect the data about relations of lifelong demographic traits (age, sex, and ethnicity) to PsA. However, the data about education, BMI, smoking and alcohol-drinking habits, and blood tests in Table 2 should not be overinterpreted as necessarily indicating predictive traits. Strengths of the study include the large, multiethnic, relatively stable cohort and the fact that all diagnoses were made by physicians.

… the link between rheumatic conditions and atherosclerosis remains a statistical association without established causal mechanisms.

We conclude that PsA is associated with increased prevalence of hypertension and heart failure. However, evidence about other independent associations between PsA and vascular conditions is unclear. ❖

Disclosure Statement

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

Table 3. Case-control comparisons for study subjects with psoriatic arthritis[a]

	Cases	Study control subjects	Difference	p value
Total blood cholesterol (mg/dL)				
Mean in 1978–1985	199.6	210.7	–11.1	0.05
Mean at diagnosis[b]	191.3	205.1	–13.8	0.004
Mean change	–8.3	–5.6	2.7	0.77
Body mass index (kg/m^2)				
Mean in 1978–1985	24.8	23.6	1.2	0.03
Mean at diagnosis[b]	28.3	26.6	1.7	0.02
Mean change	+3.5	+3.0	0.5	0.29
Systolic blood pressure (mm Hg)				
Mean in 1978–1985	124.9	123.2	1.7	0.39
Mean at diagnosis[b]	133.1	127.8	5.3	0.001
Mean change	+8.2	+4.6	3.6	0.13
Diastolic blood pressure (mm Hg)				
Mean in 1978–1985	74.5	74.1	0.4	0.77
Mean at diagnosis[b]	80.0	75.4	4.6	<0.001
Mean change	+5.5	+1.3	4.2	0.12
Blood glucose (mg/dL)				
Mean in 1978–1985	92.3	93.3	1.0	0.53
Mean at diagnosis[b]	101.1	102.9	1.8	0.67
Mean change	9.0	9.4	0.3	0.92

[a] Matched age, sex, and ethnicity. P values refer to case-control comparisons.
[b] Dates for study control subject data were closest to those of diagnosis of the matched case.

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Psoriasis And Warts

I have long had the idea that God created psoriasis and warts to teach dermatologists the merits of humility.

— Rational Drug Therapy, *Vincent Joseph Derbes, 1912-1999, American physician*

ORIGINAL ARTICLE

Augmentation of Conventional Medical Management of Moderately Severe or Severe Asthma with Acupuncture and Guided Imagery/Meditation

Lewis Mehl-Madrona, MD, PhD

Abstract

Objective: I sought to determine if a combination of acupuncture and guided imagery could augment the conventional medical management of moderately severe or severe asthma.

Design: This was an early-phase study with a convenience sample of self-selecting patients compared with self—year before, during treatment, and one year after treatment.

Setting: Patients were recruited from an outpatient practice.

Patients: All participants were adults with moderately severe or severe asthma (class 3 or 4).

Interventions: The study employed acupuncture and guided imagery/meditation for a 24-week period.

Main Outcome Measures: The main outcome measures were number of days of hospitalization, number of Emergency Department (ED) visits, number of physician visits, days per year taking steroids, puffs per week of inhaled β-agonists, FVC (forced vital capacity), FEV1 (forced expiratory volume in the first second), and FEF25-75 (forced expiratory flow between 25% and 75% of the FVC).

Results: With the addition of acupuncture and guided imagery to conventional medical management, members of the study group experienced improvement. The number of hospitalized days and the number of ED visits not leading to hospitalizations decreased, as did number of medical visits and total days taking oral corticosteroids. Parameters of respiratory function improved despite reduced use of inhaled β-agonists.

Conclusion: With acupuncture and guided imagery and meditation together, a self-selecting group of patients with moderately severe or severe asthma experienced improvement in respiratory function, taking less medication than before and having fewer emergencies and hospitalizations at a lower cost of care.

Introduction

Asthma is a serious chronic lung disease characterized by reversible airway obstruction and airway inflammation. According to the 2002 National Health Interview Survey, 30.8 million people—21.9 million adults and 8.9 million children—in the US have had asthma diagnosed sometime during their lifetime.[1] Although the American Lung Association (ALA)[2] reported, in 2005, that asthma mortality rates and hospitalizations have declined over the past few years, the health care system's burden from asthma has continued to increase since the 1980s, and asthma continues to take a significant toll on daily activities and economic productivity for many patients. The National Health Interview Survey found that in the previous year, symptoms of asthma caused children between ages 5 to 17 years to miss 14.7 million school days and caused employed adults to miss 11.8 million workdays. The ALA[2] reported in 2005 that asthma entails an annual economic cost to the US of $16.1 billion, including $11.5 billion in direct health care costs and $4.6 billion in lost productivity.

Use of Complementary and Alternative Medicine for Asthma

Many patients with asthma are attracted to complementary and alternative medicine (CAM). Blanc and colleagues[3] found that 42% of the adults surveyed with allergies or asthma had tried some form of CAM. Angsten[4] has proposed that asthma patients may be interested in CAM because of the chronic nature of their illness, because of the "perceived toxicities of therapies such as inhaled corticosteroids," and because they are attracted to the holistic approach of the treatments, which appreciates the psychological basis of disease. Davis and coworkers[5]

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believe that it is the lack of success of conventional asthma therapy that has resulted in increasing numbers of patients seeking CAM approaches.

Acupuncture Studies to Date

Although numerous studies have already been conducted to examine the effectiveness of acupuncture for adults with asthma, it is still difficult to draw definitive conclusions regarding its effectiveness. In one uncontrolled clinical series of 25 steroid-dependent asthma patients treated with acupuncture and traditional Chinese medicine (TCM), more than 80% had decreased symptoms and became less dependent on steroids.[6] In another uncontrolled clinical series,[7] 80 patients were treated with acupuncture and blood injections in points on the back (back-shu points); 39 patients were cured of their asthma (48%), 21 showed substantial improvement (26%), 15 showed some improvement (18%), and 5 (6%) showed no effect, the total effective rate being 93%.

Systematic reviews of randomized, controlled trials do not tend to support the use of acupuncture for asthma. A 1991 systematic review by Kleijnen and colleagues[8] found 13 studies that sought to assess the efficacy of acupuncture in asthma therapy. These authors concluded that claims that acupuncture is effective are not based on the results of well-performed clinical trials. However, the requirement of double-blinding, necessary before a study can be deemed of high quality according to most review scoring systems, is extremely difficult to achieve in a practitioner-delivered intervention such as acupuncture. This issue often causes well-designed acupuncture studies to be rated as low-quality trials.

… treatments are not effective outside of their use within a relational and narrative context.

A Cochrane Collaborative systematic review by McCarney and colleagues[9] of acupuncture for chronic asthma in 2004 yielded similar results. Their review of 11 studies that involved 324 participants found a lack of evidence that short-term acupuncture treatment has a significant effect on the course of asthma. However, they noted that it is questionable whether the acupuncture protocols used in the research are representative of acupuncture conducted in actual practice, considering that treatments are modified for the person depending on the practitioners' assessments and acupuncture often is one part of a package of care that includes diet and herbal medicines. The Cochrane reviewers commented that the underresearched aspect of treatment is the subjective element of this complex therapy. It is difficult to remove acupuncture treatment from its context, and this has not been addressed in existing research.

Martin and coworkers[10] conducted a systematic review and a meta-analysis of published data from 11 randomized, controlled trials. The meta-analysis did not find evidence of an effect of acupuncture in reducing asthma. However, the meta-analysis "was limited by shortcomings of the individual trials, including small sample size, missing information, adjustment of baseline characteristics and a possible bias against acupuncture introduced by the use of placebo points that may not be completely inactive."

Guided Imagery and Asthma

Guided imagery has been primarily studied as an activity done within psychotherapy. Deter and Allert[11] studied the effectiveness of group psychotherapy for asthma patients between 16 and 60 years of age. Study subjects were randomly divided into three groups: two treatment groups consisting of the exchange of information, discussion sessions about the illness, and autogenic training, which they also called "functional relaxation." A third group was the control group. The treatment group's sympathomimetic medication use was significantly reduced by one year of treatment. The use of steroids decreased, as did the number of visits to the general practitioner. The authors concluded that psychosomatic group therapy could make an important contribution to the treatment of asthma patients. They believe that body therapy practiced in autogenic training and functional relaxation was another important healing factor for the treatment, in addition to the discussion sessions and the exchange of information. Brief hypnotherapy in the style of Milton Erickson has been shown effective in improving the symptoms of asthma.[12]

What allopathic medicine labels simply asthma, TCM considers 12 different prototypes or patterns as relevant to bronchospasm: lung xu (deficiency); kidney xu (deficiency), especially kidney failing to grasp qi[a]; phlegm heat; liver fire insulting lung; wind and cold in the lung; lung invaded by wind-heat; lung qi stagnation; yang ming (large intestine); tai yin (lung); lung obstructed by damp-phlegm with spleen yang xu (deficiency); dysfunction of the ren mai (conception vessel); shi (excess) of the yin wei mai (yin linking vessel). Each of these prototypes is treated somewhat differently. Lists of points are available for treating these various aspects of asthma. Each point has a variety of uses. For example, ding chuan diffuses lung qi and calms wheezing, whereas GV-14 dispels wind and

cold, spreads and facilitates yang, regulates and stimulates the flow of qi, clears lung heat, and is used with persistent wheezing or acute respiratory distress.[13p186] For a greater understanding of these concepts, see *Acupuncture: A Comprehensive Text by Shanghai College of Traditional Chinese Medicine,* Dan Bensky translated by John O'Connor (Hardcover—1984) Taos, NM: Redwing Book Co.

The purpose of this effort was to determine if the addition of acupuncture (an externally applied treatment) and guided imagery (an internally applied approach) would benefit patients with moderately severe or severe asthma who were already receiving the best available medical treatment and still had symptoms, and who were motivated to select the combination intervention.

Relationship Effect

Elsewhere, I have argued that treatments do not have effectiveness outside of their use within a relational and narrative context. The implications of outcome research in psychotherapy—that relationship, rapport, and faith are more important than technique used—may be equally relevant to medicine.[14]

Methodology

Treatment Group

This was an early-phase study of patients whom I treated, where patients were historically compared with themselves. Thirty-six patients with asthma who visited a CAM clinic were interested in participating in a combination of acupuncture and an innovative type of group psychotherapy in the hopes that this would benefit their asthma. Patient visits were covered by their health plan. Informed consent was given for participation.

The patients were between 21 and 50 years of age ($\mu = 37$) and had had asthma for a mean duration of 24 years. There were 24 women and 12 men. Participants took the following medications: albuterol metered-dose inhalers (36), corticosteroid metered-dose inhalers (36), leukotriene inhibitors (16), oral corticosteroids (19), and cromolyn compounds (6).

Assessment of Severity of Illness

Severity of asthma was determined using the standard four-class scale of the National Institutes of Health Consensus Statement on Asthma.[15] Number of days of hospitalization, number of Emergency Department (ED) visits, number of physician visits, days per year taking steroids, puffs per week of albuterol, FVC (forced vital capacity), FEV1 (forced expiratory volume in the first second), FEF 25-75 (forced expiratory flow between 25% and 75% of the FVC), and number of "attacks," as recorded in a diary, were used to assess outcome of treatment. This information was recorded from requested medical records for the year prior to the study through the year after study subjects discontinued treatment, and for the six months during treatment. Though patients also kept this information in a diary, the data were too sporadic to be reliable and are not reported. However, the subjective sense of the diaries was one of improvement.

Informed Consent for Treatment was Obtained from All Patients.

Consistent with TCM principles, no one formula exists for the treatment of asthma. Point combinations will differ by patient. Common points used in the treatment of asthma for these patients included Bl-12, Bl-13, Bl-38, Bl-15, Bl-17, Bl-23, GV-4, Lu-1,[16] Lu-5, Lu-6 (+), Lu-7, Lu-9, LI-4, PC-6, CV-22, CV-21, CV-17, Kd-27, Kd-26, Kd-25, Kd-24, Lv-14, CV-12, CV-4, St-40, St-36, Kd-6, Kd-5, Kd-4, Kd-3, Lv-8, Lv-3, Sp-4, and ear points for lung, kidney, asthma/wheezing, adrenals, sympathetic nervous system, and shen men. Descriptions of the indications for each of these points can be found in common references, such as Interactive Body-Mind Information System (IBIS).[17]

Data Analysis

The above outcome variables were compared for the year before treatment, during treatment, and for the year after treatment using *t*-tests as implemented by Systat Software, Inc (San Jose, CA, USA).

Treatment

I treated the patients once weekly with acupuncture using combinations of the points mentioned above. Each treatment lasted 30 to 60 minutes. Guided imagery and meditation was provided weekly in a group format. Each group session lasted two to three hours. Breaks were used as needed. A portion of the group session was used for discussion of medical issues raised by group members. I was always one of the leaders of the group, so that a physician was always present. Once a month, an entire session was only "talking circle" to give participants a break from the structure and a chance to say what was on their minds. This is a traditional Native American group method in which a decorated object (the talking stick) is passed around the group. Group members speak when they hold

the object (usually a stick) without interruption until they are finished. Then the stick is passed to the next member until it passes around the entire circle. Three groups were conducted. Each group began with 12 patients. Sessions lasted 24 weeks.

Every session began with a meditation guided-imagery exercise. The content was unique to particular weeks and was implemented after the guided imagery meditation exercise. A detailed overview of the content of the 24 sessions is available on the Web site of *The Permanente Journal* (www.kp.org/permanentejournal/fall08/appendix.html) and is summarized in Table 1.

Table 1. Major topics of the 24 group sessions[a]

Session number	Topic
1	Introduction to Group
2	Introduction to Narrative: The Life Story
3	The Timeline Health History: Stress
4	The Timeline Health History: Social Support
5	Stress Reduction: How We Cope With Stress
6	Coping with Stress II
7	Alcohol, Drugs, Sugar, Fat, and Food
8	Increasing Emotional Awareness
9	Environmental Awareness
10	Health Beliefs
11	Social Functioning I
12	Social Functioning II
13	Coping Skills I
14	Coping Skills II
15	Family Influences I
16	Family Influences II
17	Evaluation of Previous Sessions
18	What Character, What Story
19	Preferred Story
20	Possible Futures
21	Family Heritage
22	Family Reconstruction I
23	Family Reconstruction II
24	Wrap-Up

[a] A detailed description of the sessions is listed in an appendix, which is available online at: www.kp.org/permanentejournal/fall08/appendix.html.

Results

Participation in the group treatment program was associated with significant improvement among patients who began treatment (Table 2). The number of days of hospitalization and the number of ED visits not leading to hospitalizations decreased markedly. The number of medical visits decreased, as did total number of days taking oral corticosteroids. The amount of albuterol used decreased, and all parameters of respiratory function improved.

Of the patients starting group psychotherapy, 15 failed to complete half of the group psychotherapy program, for a completion rate of 58%. Another five patients dropped out before the conclusion of the 24 sessions, giving a start-to-finish completion rate of 44%. Intent-to-treat analysis was conducted so that a patient remained in the treatment group even if he or she attended only one group session.

Discussion

Patients with moderately severe or severe asthma who, when visiting the CAM clinic, selectively chose a combination of acupuncture and guided imagery/meditation, experienced respiratory improvement—decreased symptoms, ED visits, and number of days of hospitalization. The addition of acupuncture and guided imagery to maximum medical management allowed for further improvement that was statistically significant. Cost savings were apparent.

The strength of an early-phase research study such as this lies in its application to a group of patients who are rarely studied in randomized, controlled trials—the patients with moderately severe to severe disease who are judged too ill for alternative therapies—and who are motivated to enter a supplemental, combination CAM-treatment intervention. The results suggest that this group may benefit the most and at cost savings.

Although the data compare the patients in the treatment group with their own historical data, evaluation of the results of the treatment group could show a bias in favor of self-selecting patients who might have had more motivation to improve. Nevertheless, in the setting of actual clinical practice (outside of research institutions), only motivated patients will attend treatment. The intent-to-treat analysis reduced some of this inherent bias. Because this study was conducted in a clinical practice, it is similar to what would be expected in other clinical practices, compared with research settings.

Elsewhere, I have argued that treatments are not effective outside of their use within a relational and narrative context. By ignoring the interpersonal and intentional aspects of medical treatment, randomization may reduce the estimation of how much we can help patients. Techniques have different efficacy with different practitioners, depending on that practitioner's commitment to the patient, care and concern, intent to be helpful, ability to build rapport, and ability to

communicate faith and expectancy of improvement. Randomized, controlled trials are excellent for deciding between two drugs about which the practitioner has no emotional attachment and in which his or her emotional attachment to the patient remains constant. Even then, the randomized, controlled trial may not reveal the "true" estimate of the drug's effectiveness, for drugs are rarely prescribed outside of a therapeutic relationship. The implications of recent outcome research in psychotherapy—that relationship, rapport, and faith are more important than technique used—may be equally relevant to medicine.

A control group does not exist to allow us to say that the results obtained in this population could not have been entirely due to relationship quality, rapport, patient faith, and physician enthusiasm. That being said, to engage with patients and to build trust, relationship, and enthusiasm, we need to do something in which we believe, and to cultivate the patients' belief in us and our techniques. Acupuncture and guided imagery may have independent efficacy (if there is such a thing) or may provide a matrix for the social interaction in which trust and relationship emerges. Either way, what matters is that patients with moderately severe or severe illness who were receiving maximal medication treatment experienced further improvement when acupuncture and guided imagery were added to their regimen. The additional costs of this extra treatment were no more

… to engage with patients and to build trust, relationship, and enthusiasm, we need to do something in which we believe, and to cultivate the patients' belief in us and our techniques.

Table 2. Outcome measures of treatment for patients (n = 36): one year before treatment to one year after treatment

Outcome measure	Treatment group[a]	Significance
Average number of days of hospitalization	**Days**	**Statistical difference between each period**
Year prior to group	9.2 (3.2)[a]	Before to during $p < 0.0001$
During 6-month group	3.1 (1.0)[b]	During to after $p < 0.0001$
Year after group	0.5 (0.13)	Before to after $p < 0.0001$
Average number of emergency department visits without hospital admission	**Visits**	
Year prior to group	5.3 (1.17)	Before to during $p < 0.0001$
During group	1.2 (0.87)	During to after $p = 1.0$
Year after group	1.2 (0.9)	Before to after $p = 0.0026$
Average number of physicians visits	**Visits**	
Year prior to group	16.1 (6.6)	Before to during $p = 0.0689$
During group	14.1 (4.70)	During to after $p = 0.0008$
Year after group	10.5 (3.94)	Before to after $p < 0.0001$
Days per year taking oral steroids	**Days**	
Year prior to group	37.1 (7.5)	Before to during $p < 0.0001$
During group	25.6 (6.4)	During to after $p < 0.0001$
Year after group	14.2 (4.0)	Before to after $p < 0.0001$
Puffs per week of albuterol	**Puffs**	
Year prior to group	68.3 (19.5)	Before to during $p < 0.0001$
During group	41.2 (12.3)	During to after $p < 0.0001$
Year after group	30.2 (10.5)	Before to after $p < 0.0001$
FEV1	**Volume (cc)**	
Year prior to group	246.0 (44.2)	Before to during $p < 0.0001$
During group	316.1 (67.9)	During to after $p = 0.0059$
Year after group	367.8 (85.2)	Before to after $p = 0.0096$
FVC	**Volume (cc)**	
Year prior to group	390.1 (80.7)	Before to during $p = 0.0188$
During group	430.0 (109.2)	During to after $p = 0.0127$
Year after group	480.6 (120.9)	Before to after $p = 0.1038$

[a] Mean ± SD.
[b] All number of visits during group were recalculated to be expressed as visits per year because the group lasted less than one year.
FEV1 = Forced expiratory volume in the first second
FVC = Forced vital capacity

than $100 Canadian per week for 24 weeks—$2400, which is now the price of two or three ED visits in Canada, depending on whether the region involved is urban or rural. ❖

[a] Qi or chi is an energy conceptualized by traditional Chinese medicine as fueling life

Disclosure Statement

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

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Breathing

Among the Diseases whereby the Region of the breath is wont to be infested, if you regard their tyranny and cruelty, an Asthma (which is sometimes by reason of a peculiar symptome denominated likewise an Orthopnoea) doth not deserve the last place; for there is scarce any thing more sharp and terrible than the fits thereof … . Breathing, whereby we chiefly live, is very much hindred by the assault of this disease, and is in danger, or runs the risque of being taken away.

— Pharmaceutice Rationalis, *Thomas Willis, 1621-1675, English physician and cofounder of the Royal Academy*

The Permanente Journal *2007 "Service Quality Award" — Institute for Healthcare Improvement 19th Annual National Forum on Quality Improvement in Health Care*

Early Discharge Study for Premature Infants: Singapore General Hospital

Yeo Cheo Lian, MD
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Cheong Chiu Peng, RN
Tay Yih Yann, RN

Abstract

Introduction: At Singapore General Hospital, approximately 240 infants of the 1500 deliveries per annum are delivered preterm, many of very low birth weight—median of 1210 g—often have extended hospital stays, even after they are declared medically fit.

Methods: To better understand the discharge patterns of the preterm infants in the department, a team of two neonatologists and two nurses performed a retrospective review of 36 premature infants. The underlying causes leading to and the root causes of discharge delays were identified as:

1. Required goal weight of 2 kg, even when medically fit
2. Delivery of discharge plan to parents delayed
3. Discharge planning delayed
4. No ownership in discharge planning.

Results/Conclusion: The length of hospital stay was reduced 59.8%, primarily by improved discharge planning, revised guidelines (mean discharge at 1915 g), and nurses' active preparation of parents psychologically and mentally for care of their babies at home.

Introduction

Premature infants are born at less than 37 weeks gestational age. At the Department of Neonatal and Developmental Medicine, Singapore General Hospital, approximately 240 infants of the 1500 deliveries per annum are delivered preterm. Many preterm infants of very low birth weight (VLBW) often stay in the hospital for extended periods of time, even after the initial support required in the neonatal intensive care unit (NICU). In the department, it has traditionally been the practice to discharge premature low birth weight infants when they were medically fit and had attained a minimum weight of 2000 g (2 kg). With increasing recognition of the benefits of early discharge to the home environment, we explored the feasibility of earlier discharge, without compromising care and outcome, of these preterm infants.

Methods

Evaluation

To better understand the discharge patterns of the preterm infants in the department, a team of two neonatologists and two nurses performed a *retrospective review* of 36 premature infants with birth weight less than 2000 g admitted to the NICU during the period May to September 2005. The median birth weight was 1210 g (range 540 g to 1920 g) with a median gestational age of 30 weeks (range 23 to 35) weeks. The median length of hospitalization was 58.2 (range 23 to 137) days (Table 1). *Reasons* for the delay in discharging the infants

Table 1. Pre- and Postimplementation

	Pre	Post
No. of infants	36	42
Birth weight	1210 (540-1920) g	1250 (535-1990) g
Age	30 weeks (23-35)	29 weeks (25-37)
Length of stay	58.2 (23-137) days	34.9 (22-44) days
Discharge weight	2055 (2000-3015) g	1915 (1840-1918) g

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Cheong Chiu Peng, RN, (bottom, left) is a Nurse Clinician in the Department of Neonatal and Developmental Medicine, Singapore General Hospital. E-mail: cheong.chiu.peng@sgh.com.sg.
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were evaluated. A discharge delay was defined as any delay in discharge not related to illness after the medical team had cleared the infant for discharge. There were 257 discharge delay days averaging seven days per infant. The reasons for the discharge delays are shown in Figure 1. The underlying causes leading to discharge delays were analyzed and the *root causes* were identified as:

1. Required minimum weight of 2 kg
2. Delayed delivery of discharge plan to parents
3. Delayed discharge planning
4. No ownership in discharge planning.

The root causes were plotted into a Pareto Diagram and the team aimed to solve the "Vital Few" causes, under Pareto principles (Figures 2 and 3). The most common reason identified for discharge delay in our center was waiting for the infant to attain a weight of 2 kg, even if medically fit for discharge. A *literature review* was completed to assess criteria adopted by other neonatal units, locally and internationally, and to identify discharge program best practices. The literature did not support the practice of discharging premature infants only at a minimum weight of 2 kg.

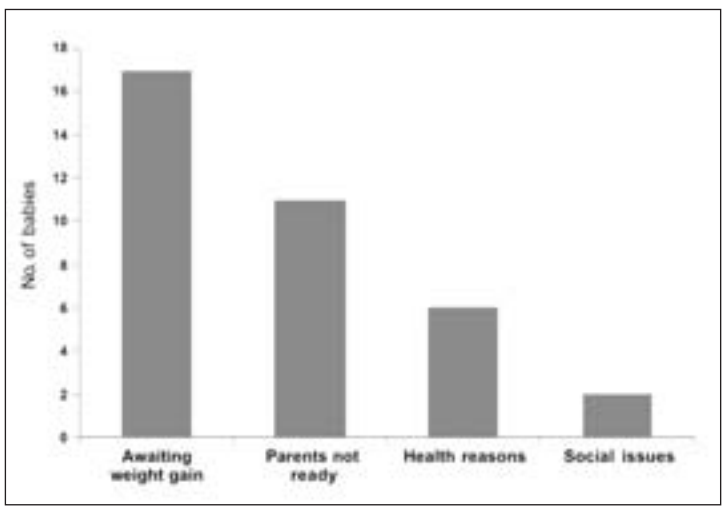

Figure 1. Reasons for prolonged length of hospital stay of 36 infants.

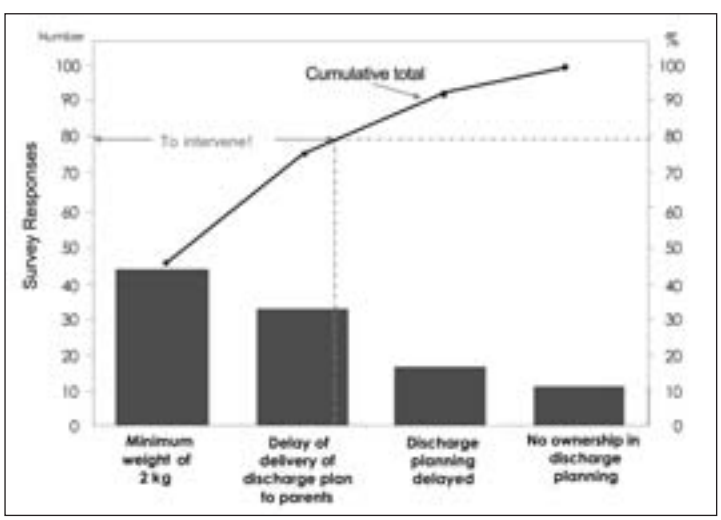

Figure 2. Root causes of discharge delays—not related to illness. Based on a survey of all Ward 54 neonatology staff.

Objective

Our objective was to develop strategies to reduce the length of hospital stay for premature infants by 30% without compromising the quality of care. Our goal was to accomplish this objective within six months.

Strategies

New Discharge Guidelines for Premature Babies

A new set of discharge guidelines for premature neonates was developed. Infants were deemed fit for discharge once they met the following criteria:

1. Medically stable with no apnoeic or cyanotic episodes for one week: feeding well on "full feeds" with no feeding-related problems like apnoea, cyanosis, or vomiting
2. Able to maintain body temperature independently
3. Satisfactory weight gain during the five to seven day period preceding discharge and weight ≥ 1800 g at discharge
4. No outstanding medical or social issues
5. Parents had completed parent education and were capable and confident to care for their infants. Parents must be committed to early discharge and to follow-up review by the neonatologist one week from the time of discharge and, thereafter, as often as deemed necessary.

Standardized Early Discharge Planning and Early Discharge Education to Parents

When the infants were medically stable, home assessments were performed and caregiving skills were taught. The multidisciplinary team in the department provided the structured teaching program, including:

- Infant bathing
- Care of infant
- Cardiopulmonary resuscitation
- Infant massage, positioning, and stimulation.

Printed Discharge Checklist and Booklet on Parenting Skills

An *Early Discharge Checklist* for the nursing team was designed to facilitate planning for early discharge. The nursing team was actively involved in the coordination and implementation of the discharge planning. A printed booklet on parenting skills was also given to each parent detailing the required home care skills.

Expansion of Nursing Role

The nurses commenced discharge planning according to the new guideline. With the process being more structured and systematic, staff were aware of their roles in performing discharge planning. The nurses felt empowered as they adopted the role of an educator, advisor, facilitator, and coordinator. The nurses also had a sense of ownership of the discharge education and planning process.

Follow-up

The designated primary care nurse made follow-up telephone calls to parents one day after discharge to ensure that parents were coping well. It also provided an opportunity for parents to raise questions, to clarify, and to discuss any issues of concern. Some home visits were arranged to assess the family's progress in making adjustment to the home care routine.

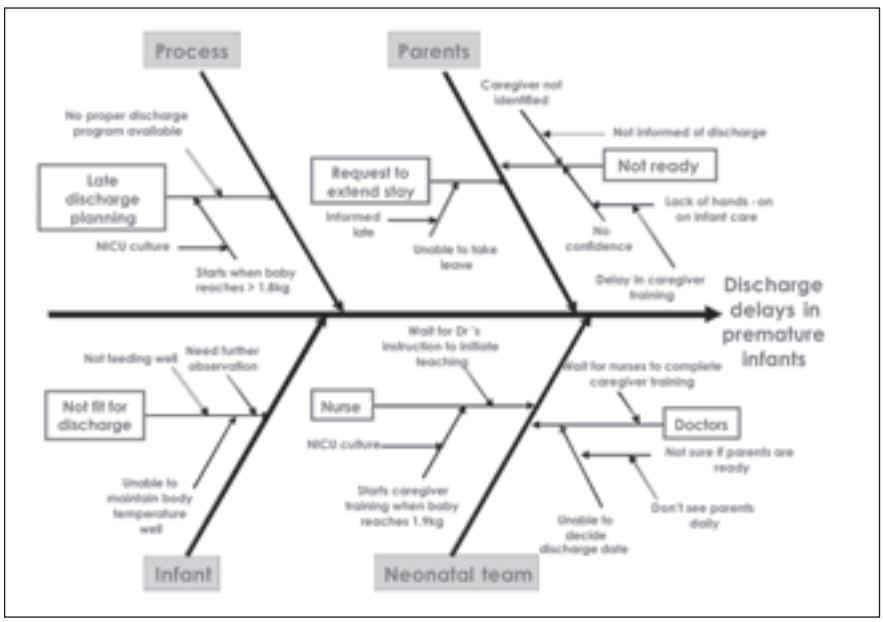

Figure 3. Discharge delay—root cause analysis.

Measures

Following implementation of the strategies, the following measures were evaluated: length of hospital stay; the need for outpatient medical consultation; Emergency Department attendance or readmission within two weeks of discharge. In addition, projected monetary cost savings were calculated.

Results

The strategies developed were implemented in January 2006. Between January and August 2006, there were 42 premature neonates discharged at a weight less than 2000 g: a median weight of 1915 g and mean postmenstrual age of 35 weeks. All the infants had a first week appointment with our neonatologist and visits continued until the infant weighed ≥2 kg. The re-admission rate was zero (0%). The median duration of hospitalization was reduced by 23.3 days (from 58.2 days to 34.9 days) (Figure 4) resulting in a cost savings of $6174 per infant.

Discussion

At Singapore General Hospital's Department of Neonatal and Developmental Medicine, care of the premature infant previously required prolonged stay in the hospital, thus the medical care is expensive. Formerly, low birth weight premature infants would only be deemed fit for discharge when they had attained a minimum weight of 2 kg.

In addition, most parents had not anticipated a premature delivery; therefore the arrival of a premature baby is a stressful period for the parents. Parents must cope with a new baby, the unfamiliar environment of the NICU, and an unfamiliar team of physicians and nurses. With the introduction of the teams' improved care process, the clinicians looked

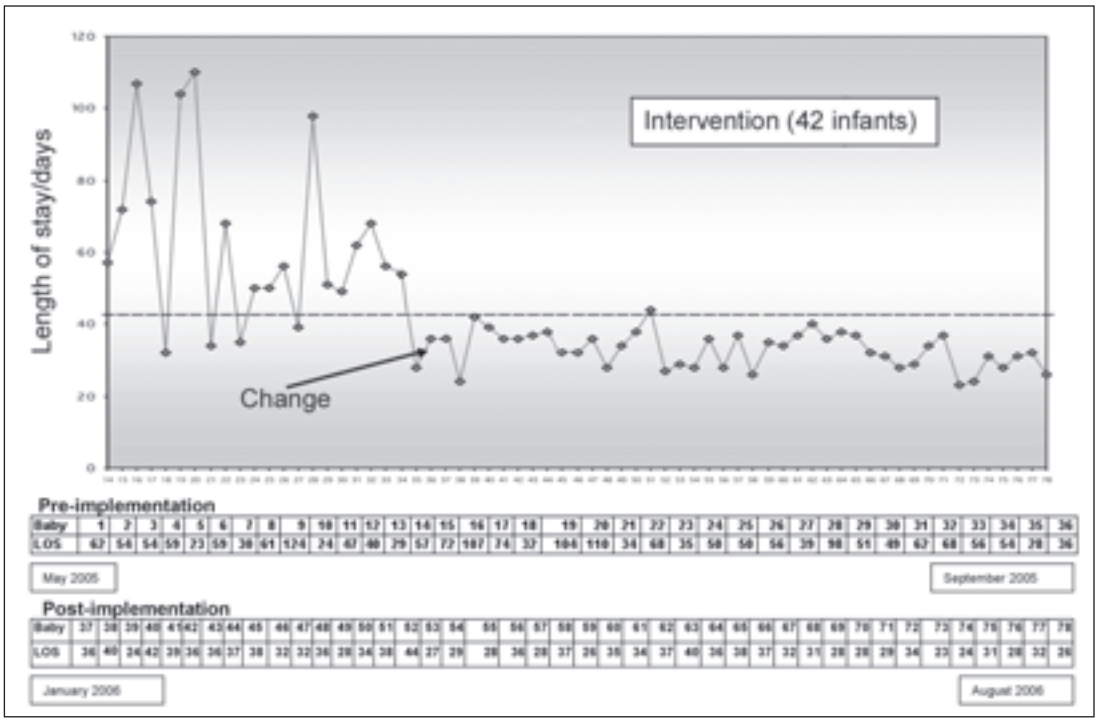

Figure 4. Evaluation of new discharge strategies from January 2006 to August 2006 (compared to baseline May 2005 to September 2005).

LOS = Length of stay.

for ways to shorten hospital stay without compromising the care of the neonates. Our department reduced the length of hospital stay for premature neonates by 59.8% primarily by implementing processes to improve discharge planning and the revised discharge guidelines. Parents were enthusiastic about the education/training component and delighted with the revised process that allowed them to bring their baby home earlier.

Early discharge of the neonates has reduced risks of nosocomial infection and promoted mother and child bonding. Parents reported feeling that they had active and meaningful participation in care.

The team, briefed on the new guidelines and process, conducted audits on full compliance of the program. The primary care nurse followed-up with telephone calls to parents a day after discharge to ensure that parents were coping well. The nurse clinician made a follow-up call to the parents on the fourth day after discharge. The readmission rate of the babies was also monitored. Regular feedback was collected from the parents on the coping skills at home and advice was given appropriately.

Parents must be coached by nurses to prepare them psychologically and mentally for the care of their babies. This communication is the key to success in the program.

Conclusion

Nurses must understand the importance of early discharge of premature infants and motivate parents to participate early in the care of the infant. Discharge planning has to be initiated as soon as the baby is admitted into the hospital. Parents must be coached by nurses to prepare them psychologically and mentally for the care of their babies. This communication is the key to success in the program.

We continue to monitor results and obtain feedback from parents, nurses, and physicians. With the revision of the protocol by the medical team, the baby is ready for discharge at 1800 g and when parents are confident to care for the baby in the home setting. We propose this system as a model for improving the quality of care for neonates and simultaneously decreasing the cost of care for the premature infant. ❖

Disclosure Statement

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

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"Sara's Trees"

photograph

By Stephen Weiss, MD

Stephen Weiss, MD, is an Internist at the Petaluma Medical Offices. He also has a Doctor of Mental Health degree from the University of California, San Francisco with a specialty in Geriatric Mental Health. "Sara's Trees" was a brief moment captured on a drive along a rural Napa County road. Dr Weiss describes seeing the world as compositions, images as they would be framed through the camera. He likes asymmetry in the photographs that force the eye to move into the image. He is currently working on a project doing portraits of family farmers and landscapes in the Central Valley. "You can walk outside in Sonoma County with your eyes closed and get a good landscape, but I am finding that the Central Valley demands much more to get a well-composed photograph."

The Permanente Journal *2007 "Service Quality Award" — Institute for Healthcare Improvement 19th Annual National Forum on Quality Improvement in Health Care*

Counseling and Wellness Services Integrated with Primary Care: A Delivery System That Works

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Introduction: The continuity and coordination of care between medical and behavioral health services is a major issue facing our health care delivery system. Barriers to basic communication between providers of medical services and providers of behavioral health services, include: no coordination of services, and poor recognition of the relationship between medical and behavioral issues.

Methods: Colocating behavioral health counselors and nutritionists alongside primary care physicians and clinicians (PCPs).

Results: Grand Valley Health Plan (GVHP) established the national benchmark for patients using ambulatory services for mental health, and ranked first in Michigan on all six HEDIS "effectiveness of care" measures for behavioral health. One result was a 54% decrease in mental health hospitalization.

Discussion: Up to 70% of primary care visits are driven by psychosocial factors, with 25% of patients having a diagnosable mental disorder, and comorbidity occurring in up to 80%. With colocated services, PCPs now often explain to patients that "this is just how we deliver care to you," when introducing health coaches to patients and asking them to be involved.

Fifty percent of all behavioral health care is delivered by PCPs,[4] ...

Background

The continuity and coordination of care between medical and behavioral health services is a major issue facing our health care delivery system.[1] There are barriers to basic communication between providers of medical services and providers of behavioral health services, there is often no coordination of services, and there is poor recognition of the relationship between medical and behavioral issues in the current health care delivery system.[2]

Grand Valley Health Plan (GVHP) is a staff-model health plan in Grand Rapids, MI, that has been integrating health care delivery in a team-based system for 25 years. Behavioral health counselors and nutritionists have always been employees of the health plan, along with family practice physicians, midlevel practitioners, and other staff providing primary care services in family health centers. The focus of these counseling and wellness services and how those services have been delivered has varied, and at times, despite being part of the same organization and same team, the services still were not well integrated. The services provided by behavioral health counselors and nutritionists were not always well coordinated with primary care physicians and clinicians (PCPs), and traditional counseling models and hour-long appointments were being used by the behavioral health counselors and nutritionists. PCPs would also commonly treat patients with psychotropic medications without involving the behavioral health counselor. For a brief period of time, counseling and wellness services were provided in two centralized locations, but this resulted in much higher no-show and cancellation rates as well as less communication between counseling and wellness staff and the PCPs.

Purpose of Study

In 2002, GVHP had poor performance in many behavioral health measures, including high rates of mental health hospitalizations and poor HEDIS scores. We also recognized the challenge of transforming our system from the inside out and to more fully integrate

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counseling and wellness services into primary care. As a result, GVHP formed an interdisciplinary task group to redesign counseling and wellness services. The stated goal was to have population-based counseling and wellness services integrated into the GVHP group practice that targets patients at high risk, focuses on behavior change, and effectively expands the number of patients receiving services.

GVHP hired a consultant from Mountainview Consulting Group, Inc, who specializes in the integration of behavioral health with primary care, to assist us in this redesign. We focused on the following basic principals and assumptions:

- The medical system is the de facto mental health system in the US.[3] Fifty percent of all behavioral health care is delivered by PCPs,[4] and only about 6% of the population seeks behavioral health treatment in a traditional behavioral health setting.[1]
- Patients receiving care in our health center have mental health issues but also other lifestyle and behavioral issues that affect their health. It has been found that 25% of patients receiving primary care services have a diagnosable mental disorder[5] and that mental disorders frequently co-occur with other mental or physical disorders. Estimates of this comorbidity range from 20% to 80%.[6] In addition, it is estimated that up to 70% of primary care visits are driven by psychosocial factors.[7] Our own experience at GVHP has been that the mind–body connection influences a high number of primary care visits and that patients with medical diagnoses and disease often have behavioral and lifestyle factors that increase their risk. Patients may struggle with compliance, lack good support, have limited resources, or may have anxiety or depressive symptoms that are barriers to appropriate response and consistent management of their condition.

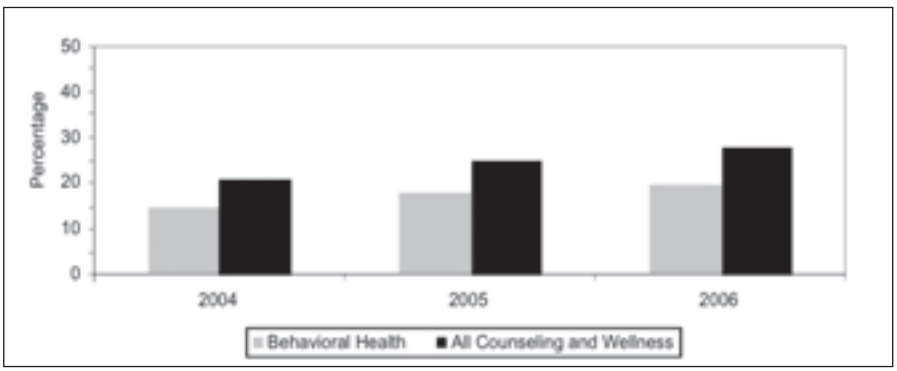

Figure 1. Percentage of Grand Valley Health Plan patients seen by counseling and wellness staff in primary care (internal data).

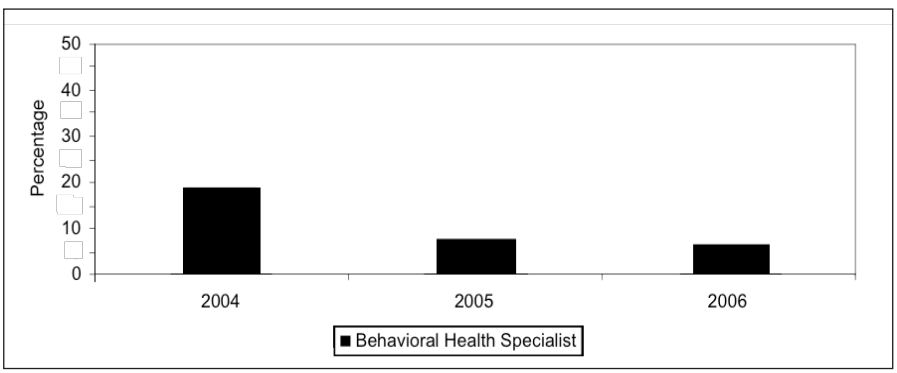

Figure 2. Percentage of Grand Valley Health Plan patients referred to behavioral health specialist (internal data).

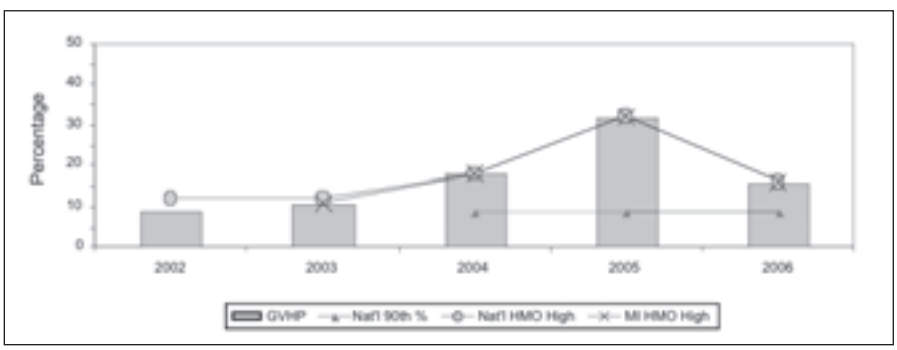

Figure 3. HEDIS patients receiving ambulatory mental health services.
GVHP = Grand Valley Health Plan; HMO = health maintenance organization; MI = Michigan.

Methods

The redesign of services, implemented in September 2003, had the following components:

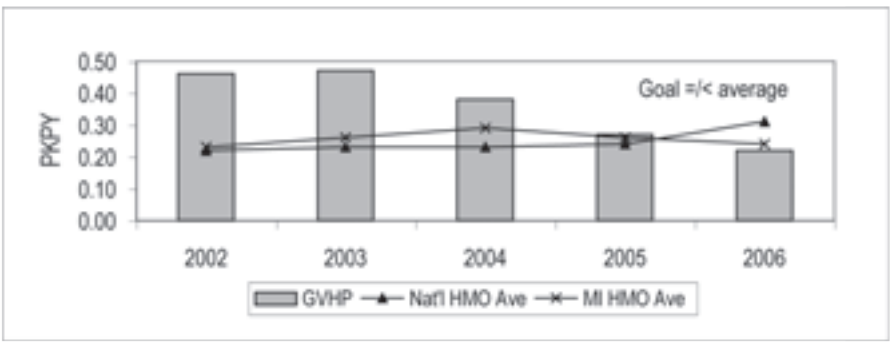

Figure 4. Patients receiving inpatient mental health services (National Committee for Quality Assurance HEDIS).

GVHP = Grand Valley Health Plan; HMO = health maintenance organization; MI = Michigan; PKPY= per thousand per year.

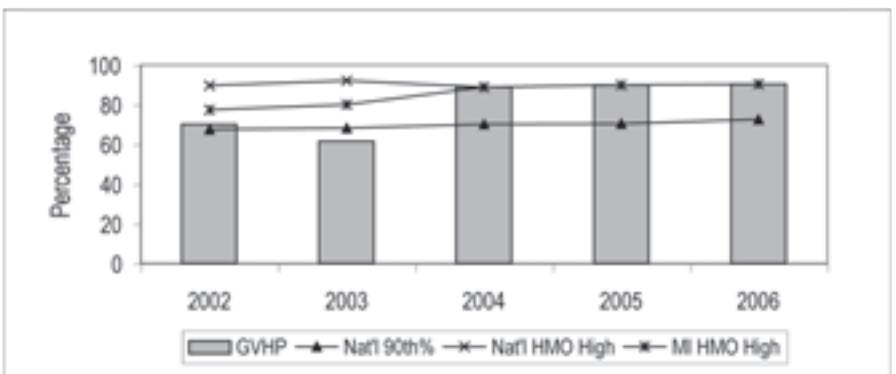

Figure 5. HEDIS mental health hospitalization follow-up in seven days.

GVHP = Grand Valley Health Plan; HMO = health maintenance organization; MI = Michigan.

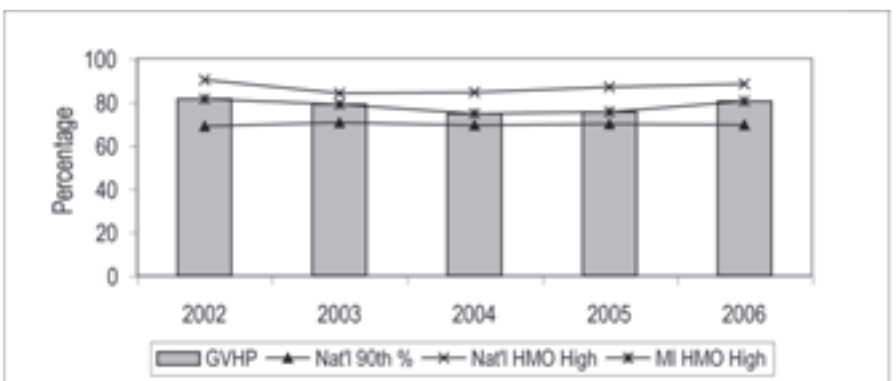

Figure 6. HEDIS antidepressant acute-phase treatment.

GVHP = Grand Valley Health Plan; HMO = health maintenance organization; MI = Michigan.

- We implemented colocation of counseling and wellness (C&W) staff (behavioral health counselors and nutritionists) in all GVHP health centers and placed their workstations alongside those of PCPs
- We began calling C&W staff *health coaches*
- We established 15- to 30-minute appointments for C&W staff to provide timely access for patients and PCPs
- We provided targeted training for health counselors and PCPs in the new model and the techniques and skills to implement it
- We established 50% of daily C&W appointments as same-day appointments
- We provided basic triage, assessment, consultation, and health counseling to patients at their health centers
- We established evidence-based care guidelines for the delivery of C&W services
- We focused on services for traditional behavioral health and dietary issues but also on lifestyle and behavior factors that impact patients' health and management of disease.

Barriers

Implementation of this model required a paradigm shift by C&W staff accustomed to providing care in traditional settings and models of care. Staff reported that it was difficult to begin to call or view themselves as a health coach rather than a therapist or counselor. Moving from the traditional 50-minute sessions to 15 to 30-minute appointments required a very different approach to interviewing and intervening with patients. This model also required shifts by clinicians who were not accustomed to sharing patients and who were used to making referrals to C&W staff only for quite traditional behavioral health or dietary issues. There was high variation in PCP patterns of screening for behavioral health issues during primary care visits, and it was difficult to get PCPs to more consistently screen patients for behavioral health and lifestyle issues. This meant both training and mentoring them about expanding not only what questions to ask to better screen for mental health

conditions but also their view of the types of patients who could benefit from C&W services.

Results

The impact of integration has been substantial, with the intended result of more patients being seen by C&W staff, improved access, and improved quality of care. There were also results that were not targeted or anticipated, such as improvements in all measures relating to mental health hospitalizations. Some highlights are as follows:

- GVHP's C&W staff saw 26.7% of the total health plan membership in 2006 (Figure 1)
- GVHP primary care behavioral health counselors were able to treat more patients at the primary care level, resulting in significantly fewer referrals to behavioral health specialists (Figure 2)
- GVHP was ranked first in Michigan on all six effectiveness of care HEDIS measures for behavioral health (Figures 3–8)
- GVHP more than doubled access to and use of services by patients in three years and established the national benchmark for patients using ambulatory services for mental health (Figure 3)
- GVHP's mental health hospitalization rate decreased by 54% since 2002 (Figure 4).

From a financial standpoint, GVHP has made a financial commitment to this delivery system in having C&W staff as salaried employees of the health plan. A full cost analysis has not been made, but cost savings have been seen in lower hospitalization costs and fewer specialty care referrals. The medical cost savings has not been analyzed in terms of offset from lower medical costs.

Conclusions

With barriers to communication and coordination of care removed, medical and C&W services have become much more integrated at GVHP. The use of C&W services has been significantly increased for health plan members and PCPs are recognizing the benefits of using the skills of the C&W staff. This has also led to positive outcomes and supports the evidence that integration has improved the quality of care. GVHP is a leading performer on most behavioral health measures used by health plans. In addition, we believe that patients' general health care is also being affected by using C&W staff to work with patients on behavioral change as it relates to various disease states and chronic conditions. PCPs often explain to patients that "this is just how we deliver care to you" when introducing health coaches to patients and asking them to be involved.

GVHP has made a philosophical and financial commitment to this integrated model of care delivery. We have found it necessary to operate health centers consistently with C&W staff to maintain this approach to care, and this is a significant financial investment. Philosophically, you cannot use this approach part time. Many PCPs now have the expectation that health coaches will be avail-

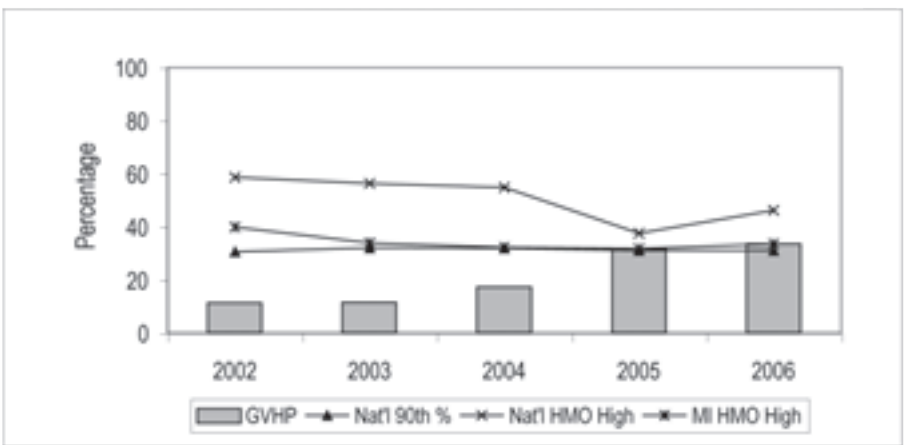

Figure 7. HEDIS antidepressant optimal contacts.
GVHP = Grand Valley Health Plan; HMO = health maintenance organization; MI = Michigan.

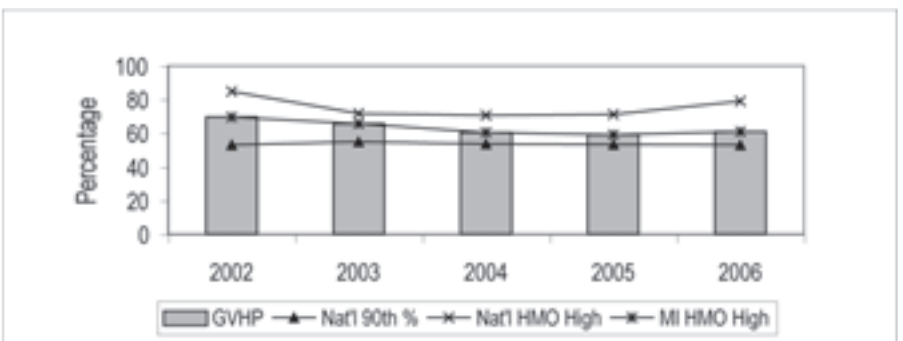

Figure 8. HEDIS antidepressant continuation phase treatment.
GVHP = Grand Valley Health Plan; HMO = health maintenance organization; MI = Michigan.

able for consultation.

GVHP continues to try to penetrate further into its health plan membership. The current focus is on patients in population-based programs and other high-risk populations who can be better treated using this integrated-care model. If at least 50% of the patients seen in primary care have psychosocial issues affecting their health, our goal is to continue to use our integrated model to provide timely and targeted services that will lead to quality outcomes. ❖

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Disclosure Statement

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

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The Hidden Ingredient

The human body experiences a powerful gravitational pull in the direction of hope. That is why the patient's hopes are the physician's secret weapon. They are the hidden ingredients in any prescription.

— Norman Cousins, 1915-1990, American editor and author

ORIGINAL ARTICLE

Are Foot Abnormalities More Common in Adults with Diabetes? A Cross-Sectional Study in Basrah, Iraq

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Samir Ghani Dahyak, MD

Abstract

Background: Altered foot biomechanics, limited joint mobility, and bony deformities with neuropathy, peripheral vascular disease, and infection have been associated with an increased risk of ulceration and amputation among patients with diabetes. The aim of our study was to estimate prevalence of foot abnormalities among Iraqis with diabetes and to see if they are more common than in a control population.

Methods: We structured the study as a comparative outpatient clinic study. The study population consisted of 100 patients with type 2 diabetes and 100 patients without diabetes as the control group. The study was conducted between January 2006 and August 2007. The patients and study control subjects were selected from the outpatient clinic at Al-Faiha Hospital in Basrah, southern Iraq. All were adults of at least 40 years of age.

Results: There were no differences between the two groups regarding sex, age, weight, qualifications, smoking status, marital status, or residency, but patients with diabetes had a higher body mass index and a higher socioeconomic status. No differences were found in the type of footwear worn or in occupation. Foot abnormalities associated with diabetes were prominent metatarsal heads, hammertoe, high medial arch, wasting, joint stiffness, amputation, fissures, nail changes, ulcer, and dermopathy on univariate analysis. With a multivariable model using logistic regression, only wasting (odds ratio [OR], 0.21; 95% confidence interval [CI], 2.16–11.33; p = 0.0002), ulcer (OR, 0.08; 95% CI, 1.12–134.59; p = 0.03), and dryness (OR, 0.11; 95% CI; 1.19–7.32; p = 0.01) remained significantly associated with diabetes.

Conclusion: We checked for 17 foot abnormalities associated with diabetes and found that 13—prominent metatarsal head, high medial arch, hammertoe, wasting, joint stiffness, amputation, fissures, nail changes, ulcers, blisters, dryness, sclerosis, and dermopathy—were statistically more frequent in study participants with diabetes than in control study subjects without diabetes. In a logistic regression model, only wasting, ulcer, and dryness remained strongly associated with diabetes. A larger study is needed to see the relationship of these abnormalities with footwear worn, duration of wearing footwear, occupation, duration of diabetes, and insulin use.

Introduction

Foot problems are common in patients with diabetes, often requiring prolonged and costly hospital stays and eventually leading to lower extremity amputation.[1]

Motor neuropathy affects the function of the intrinsic and extrinsic musculature of the foot, thus upsetting the delicate balance between flexors and extensors of the toes.[2] Atrophy of the small muscles responsible for metatarsophalangeal (MTP) plantar flexion is thought to lead to the development of hammertoes, claw toes, prominent metatarsal heads, and pes cavus.[3] Unfortunately, structural deformities are common sites of abnormally high pressure. Repetitive pressure at these sites can result in tissue breakdown and in calluses, and in the absence of protective sensation, continued activity can cause the calluses to thicken, hemorrhage underneath, and eventually ulcerate.[4,5]

Altered foot biomechanics, limited joint mobility,

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bony deformities with neuropathy, peripheral vascular disease, and infection have been associated with an increased risk of ulceration and amputation.[6,7] The critical triad most commonly seen in patients with diabetic foot ulcers is peripheral sensory neuropathy, deformity, and trauma. All of these risk factors are present in 65% of diabetic foot ulcers.[8]

Autonomic neuropathy is reflected by decreased sweating, loss of skin temperature regulation, and autosympathectomy. Anhydrosis results in xerotic skin and predisposes skin to fissures, cracks, and callus formation.[9]

Appropriate footwear is integral to ulcer prevention.[10] Prescription footwear and custom-fitted orthotics have been shown to prevent occurrence and recurrence of complications and increase patients' use of shoes outdoors. Clinical recommendations for people with diabetes include provision of special footwear to individuals with foot risk factors.[11]

Clinical recommendations for people with diabetes include provision of special footwear to individuals with foot risk factors.[11]

We found, in a previous study conducted in Basrah, Iraq, that structural foot abnormalities in patients with diabetes had the following incidences: prominent metatarsal heads in 36.2%, wasting in 11.5%, hammertoes in 10.9%, pes cavus in 5.4%, claw toes in 3.8%, and amputation in 2.1%. Skin changes included dryness of the skin in 17%, fissures in the skin in 14.7%, calluses in 14.2%, tinea pedis in 13.7%, foot ulcer in 13.7%, and nail changes in 7.1%.[12] Peripheral neuropathy and dermopathy were seen in 21.9% and 6%, respectively. Although it is widely assumed that these foot abnormalities are more common in patients with diabetes, a comparison of abnormalities in patients with diabetes versus abnormalities in study control subjects without diabetes has not been reported before.

In this study, we sought to estimate the prevalence of foot abnormalities among patients with diabetes and to determine whether they are more common than persons without diabetes.

Research Design and Methods

This was a comparative outpatient clinic study. The study population consisted of 100 patients with type 2 diabetes; 100 patients without diabetes served as the control group. The study was conducted between January 2006 and August 2007. Patients and study control subjects were selected from the outpatient clinic from Al-Faiha Hospital in Basrah, in southern Iraq. We included only adults aged 40 years and older; women were included only if they were not pregnant. Patients who were dieting, with or without drug therapy, to treat diabetes were considered diabetic.

For all patients, a medical history was taken, which included age, smoking status, job status, and education (years of school attended). Patients who were cigarette smokers were considered smokers, whereas those who had been smoke free for at least one year were considered nonsmokers. Socioeconomic status was calculated, and each patient was classified into low or intermediate socioeconomic status on the basis of the aggregate score of education level, occupation, and income.[13p25-6] Residency was divided into rural and urban according to patients' addresses.

Patients' footwear types were divided into sandals, sneakers, cut shoes (locally made shoes not related to foot conditions), shoes, and boots. The patients who used footwear were divided into two groups: those whose footwear use was >12 hours/day and those whose use was ≤12 hours/day.

Weight, height, and body mass index ([BMI] calculated according to the Quetelet formula: weight in kilograms divided by height in square meters) were determined for all patients.

Definitions

Each foot was evaluated and examined during the study by one of the two authors for the following abnormalities. If an abnormality was present in either foot, the individual was considered to have the abnormality.

Structural foot abnormalities were defined as follows:

- Prominent metatarsal heads were defined as "any palpable plantar prominences of the metatarsal site of the foot"
- High medial arch (pes cavus) was defined as "an abnormally high medial longitudinal arch, which extends between the first metatarsal head and the calcaneus"[5,14–17]
- Extension contracture at the MTP joint with flexion contracture at the proximal interphalangeal (PIP) joint was called hammertoe
- Hyperextension of the MTP and flexion of the PIP and distal interphalangeal joint was called claw toe[18]
- Wasting was defined as guttering between metatarsal heads[15]
- Joint stiffness was defined as any limitation of dorsiflexion of the forefoot or toes[19]
- Hallux valgus was defined as a lateral angulation of the first MTP joint of the great toe.[20]

Abnormalities of the skin of the foot were defined as follows:

- Callus was defined as any hyperkeratotic formation due to shear stresses, usually in proximity to a bony prominence
- Dryness was assessed objectively
- Fissures were defined as any skin break that did not fit the definition of foot ulcer
- Nails changes included any longitudinal ridging, fissuring, separations, loss, or thickening[5,14–16]
- Diabetic foot ulcer was defined as any full-thickness skin lesion distal to the ankle, excluding minor abrasions, fissures, or blisters
- Interdigital fungal infection (tinea pedis) was defined as any white, macerated skin in any web spaces.[21]

Statistical Analysis

All data were analyzed in 2007 by SPSS version 8.0 for Windows (SPSS Inc, Chicago, IL). Differences between the groups were tested by Student *t*-test in the case of continuous data and by χ^2 test or Fisher's exact test (low numbers) in the case of categoric data. Univariate analysis was performed to determine each foot abnormality's association with diabetes. Variables found associated with diabetes in univariate analyses were then entered into a multivariable model using logistic regression to determine the power of each foot abnormality for association with diabetes. A p value of <0.05 was considered statistically significant.

Results

Characteristics of patients with diabetes and of study control subjects are detailed in Table 1. Of patients

Table 1. Study participant characteristics

Characteristics		No. of participants with diabetes (%)	No. of participants without diabetes (%)	p value
Sex	Men	41 (41.0)	48 (48.0)	NS
	Women	59 (59.0)	52 (52.0)	
Age (years), mean ± SD		58.34 ± 10.61	56.02 ± 10.42	NS
Weight (kg), mean ± SD		69.83 ± 16.73	68.73 ± 12.15	NS
Body mass index		26.15 ± 6.16	25.14 ± 5.06	<0.001
Education (years)		3.28 ± 4.58	3.97 ± 5.10	NS
Smoker		19 (19.0)	20 (20.0)	NS
Duration of diabetes		3.96 ± 6.06	—	
Insulin use (any type, for any duration)		26 (26.0)	—	
Marital status	Married	100 (100.0)	98 (98.0)	NS
	Unmarried	0 (0.0)	2 (2.0)	
Residency	Urban	66 (66.0)	69 (69.0)	NS
	Rural	34 (34.0)	31 (31.0)	
Socioeconomic status	Intermediate	23 (23.0)	10 (10.0)	0.02
	Low	77 (77.0)	90 (90.0)	
Total sample		100	100	

NS = not significant; SD = standard deviation

Table 2. Type of footwear, duration of wearing, and occupation

		No. of participants with diabetes (%)	No. of participants without diabetes (%)	p value
Type of footwear	Sandals, sneakers	88 (88.0)	87 (87.0)	1.0
	Cut shoes, shoes, boots	12 (12.0)	13 (13.0)	
Duration of wearing	>12 hours	14 (14.0)	3 (3.0)	0.009
	≤12 hours	86 (86.0)	97 (97.0)	
Occupation	Worker	20 (20.0)	27 (27.0)	0.52
	Farmer	3 (3.0)	2 (2.0)	
	Housewife	56 (56.0)	47 (47.0)	
	Unemployed	21 (21.0)	24 (24.0)	

Table 3. Foot abnormalities among study participants

	No. of participants with diabetes (%)	No. of participants without diabetes (%)	p value
Structural abnormalities			
Prominent metatarsal head	57 (57.0)	36 (36.0)	0.004
High medial arch	14 (14.0)	3 (3.0)	0.009
Hammertoe	29 (29.0)	13 (13.0)	0.009
Claw toe	7 (7.0)	4 (4.0)	NS
Hallux valgus	16 (16.0)	13 (13.0)	NS
Wasting	66 (66.0)	23 (23.0)	<0.001
Joint stiffness	33 (33.0)	6 (6.0)	<0.001
Amputation	9 (9.0)	1 (1.0)	0.01
Skin changes			
Callus	75 (75.0)	66 (66.0)	NS
Fissures	90 (90.0)	76 (76.0)	0.01
Nail changes	76 (76.0)	52 (52.0)	0.001
Ulcers	27 (27.0)	1 (1.0)	<0.001
Tinea pedis	1 (1.0)	0 (0.0)	NS
Blisters	1 (1.0)	0 (0.0)	0.04
Dryness	1 (1.0)	0 (0.0)	<0.001
Sclerosis	1 (1.0)	0 (0.0)	<0.001
Dermopathy	38 (38.0)	3 (3.0)	<0.001

NS = no significance

Table 4. Multivariate association of foot abnormalities with diabetes

	B	Odds ratio (95% confidence interval)	p value
Constant	–29.5		NS
Structural abnormalities			
Prominent metatarsal head	–0.4	0.00 (0.25–1.44)	NS
High medial arch	1.3	0.06 (0.88–18.34)	NS
Hammertoe	0.0005	0.00 (0.38–2.59)	NS
Wasting	1.5	0.21 (2.16–11.33)	0.0002
Joint stiffness	1.06	0.07 (0.95–8.90)	NS
Amputee	2.1	0.03 (0.54–123.56)	NS
Skin changes			
Fissures	0.3	0.00 (0.48–4.31)	NS
Nail changes	0.7	0.05 (0.89–4.91)	NS
Ulcers	2.5	0.08 (1.12–134.59)	0.03
Blisters	4.7	0.00 (0.00–0.64 E+18)	NS
Dryness	1.0	0.11 (1.19–7.32)	0.01
Sclerosis	-0.08	0.00 (0.30–2.72)	NS
Dermopathy (shin spots)	1.5	0.09 (1.11–21.28)	0.03

NS = no significance

with diabetes, 41.0% were men and 59.0% were women versus 48.0% men and 52.0% women in the control group (p = 0.39). There was no difference between the groups in age, weight, education level, smoking status, marital status, or residency (urban vs rural). The BMI in the group with diabetes was 26.15 ± 6.16 kg/m^2 vs 25.14 ± 5.06 kg/m^2 for the control group (p < 0.001). The duration of diabetes was 3.96 ± 6.06 years. Of the group with diabetes, 26.0% were taking insulin. In the socioeconomic category, 90% of the control group was of low socioeconomic status, whereas 77% of the group with diabetes was of low socioeconomic status.

The type of the footwear worn and number of hours it was worn daily are detailed in Table 2. There was no difference between the two groups regarding the type of footwear worn, whether sandals, sneakers, shoes, or boots. Ninety-seven percent of the control group had worn footwear for ≤12 hours and 86% of the group with diabetes had done so (p = 0.009). There was no significant difference between the two groups regarding occupation (p = 0.52).

The distribution of structural foot abnormalities is detailed in Table 3. Prominent metatarsal heads (57.0% vs 36.0%; p = 0.004), high medial arch [pes cavus] 14.0% vs 3.3%; p = 0.009), and hammertoes (29.0% vs 13%; p = 0.009) occurred more often in the diabetes group than in the control group. Claw toes (7.0% vs 4.0%) and hallux valgus (16.0% vs 13.0%) were seen almost equally in both groups. Wasting was more common (66.0% vs 23.0%; p < 0.001) in the diabetic group than in the control group. Joint stiffness (33.0% vs 6.0%; p < 0.001) and amputation (9.0% vs 1.0%; p < 0.018) occurred more often in the diabetes group than in the control group.

There were no statistically significant differences between the two groups regarding callus rate (75.0% for the diabetes group vs 66.0% for the control group), but fissures (90.0% vs 76.0%) were more common in the diabetic group (p = 0.013). Nail changes (76.0% vs 52.0%), ulcers (27.0% vs 1.0%), and dermopathy (38.0% vs 3.0%) were far more common in the diabetes group (p < 0.001).

When the 13 foot abnormalities significantly associated with diabetes were entered simultaneously into a logistic regression model (Table 4), only wasting (odds ratio [OR], 0.21; 95% confidence interval [CI], 2.16–11.33; p = 0.0002), ulcer (OR, 0.08; 95% CI, 1.12–134.59; p = 0.03), and dryness (OR, 0.11; 95% CI, 1.19–7.32; p = 0.01) remained strongly associated with diabetes.

Discussion

To our knowledge, this was the first attempt to study the prevalence of foot abnormalities in detail among Iraqis with diabetes.

The BMI in the diabetes group of this study was higher than in the control group. This was confirmed in an earlier study in Iraq.[22]

No difference in the smoking rate was found between groups in this study; however, smoking is a known risk factor for diabetes foot ulcer.[23]

No difference was found between types of footwear worn or occupation in both groups, but more of those who had worn footwear ≤12 hours were in the control group than in the diabetes group. Though the aim of this study was not to show the relationship between footwear worn and duration of wearing footwear, occupation, and foot abnormalities, because studies have confirmed that inappropriate footwear is the most common source of trauma and cause of ulceration in patients with diabetes,[24] and Jayasinghe and coworkers[25] even found that walking barefoot is a risk factor for diabetic foot disease in Sri Lanka.

In western Washington State health care organizations, a survey of 400 diabetic patients found pes cavus in 19.5%, hallux valgus in 23.9%, and hammertoes/claw toes in 46.7%;[17] whereas in our study, pes cavus (high medial arch) was seen in 14.0%, hallux valgus in 16.0%, and hammertoes/claw toes in 36.0%. The prevalence of calluses in both groups in our study did not differ; however, there is a clear association between pathologic foot pressures as well as callus formation and the incidence of plantar ulcerations in other studies.[26,27]

Dryness was reported in this study in 1% of the diabetes group. Others have reported percentages ranging from 75% to 82.1%.[28] This discrepancy may be due to differences in the definition of dryness.

Conclusion

We gathered data on 17 foot abnormalities associated with diabetes and found that 13 were statistically more frequent than in study control subjects without diabetes: prominent metatarsal head, high medial arch, hammertoe, wasting, joint stiffness, amputation, fissures, nail changes, ulcers, blisters, dryness, sclerosis, and dermopathy. In a logistic regression model, only wasting, ulcers, and dryness remained strongly associated with diabetes. A larger study is needed to see the relationship of these abnormalities with the type of footwear used, daily duration of footwear use, occupation, duration of diabetes, and insulin use. ❖

Editor's Note

When this manuscript appeared in our mail box, we asked ourselves how and why it came to us. We asked the authors and they replied that they read the journal regularly online and that it is popular with a lot of doctors in Iraq. We were pleasantly surprised by the scope of our online readership and we are happy to publish this article.

Disclosure Statement

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

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Each Day's Work

As to your method of work, I have a single bit of advice, which I give with the earnest conviction of its paramount influence in any success which may have attended my efforts in life—Take no thought for the morrow. Live neither in the past nor in the future, but let each day's work absorb your entire energies, and satisfy your widest ambition.

— After Twenty-Five Years, *William Osler, MD, 1849-1919, American physician, pathologist, author, and historian*

"College Avenue"

18" x 24"
Chalk pastel on Belgian Mist Kitty Wallis Professional Grade paper

By Pamela Fox

Pamela Fox is a Communications Specialist for The Permanente Medical Group, Government Affairs. She has a Bachelor of Fine Arts in Fashion Design. An artist all her life, she works mainly from life: people, animals, street scenes.

Ms Fox says that her connection to artwork is through the sheer pleasure of color and shape and by drawing a subject to feel deeply connected to it by its form. She took the photo of this flower stand and the vendor in an alley off College Avenue in Berkeley, CA. She was drawn by the perspective, the flowers, and the story created by the flower seller relaxing in the sun.

REVIEW ARTICLE

The Role of B-Type and Other Natriuretic Peptides in Health and Disease

Ashok Krishnaswami, MD, FACC

Abstract

Natriuretic peptide (NP) physiology is a complex field. NPs also are known to be highly phylogenetically preserved. NPs can be thought of as counterregulatory hormones antagonizing the effects of the renin-angiotensin-aldosterone and sympathetic systems. These peptides are primarily responsible for maintaining salt and water homeostasis, but they also have vasodilatory properties. It was originally thought that B-type NP (BNP) and *N*-terminal-pro-BNP are secreted in a 1:1 ratio. However, recent data has shed further light into this area. Commercial assays for NPs will need to keep up with these changes. Currently, BNP levels within Kaiser Permanente are obtained by multiple providers in a variety of clinical scenarios in order to help them manage their patients. Therefore, a basic understanding of the physiology of NPs and the methodology of assays are needed to appropriately interpret an NP test result within the corresponding clinical scenario.

Introduction

B-type natriuretic peptide (BNP) is a cardiac biomarker that has become increasingly useful in numerous clinical settings. It was first discovered by de Bold and colleagues[1] in 1981. The application of the physiology of the natriuretic peptides (NPs) has led to numerous clinical trials that have attempted to assess the indications for the diagnostic and therapeutic use of BNP. A rudimentary search for *NPs* and *BNP* on PubMed resulted in 17,020 and 3372 articles, respectively.

The mechanisms of action of NPs under normal conditions and in pathologic states are extremely complex. In daily clinical practice, physicians address only a small area within the spectrum of natriuretic physiology. Physicians and other clinicians experience a good deal of confusion and frustration in interpreting BNP values within specific clinical scenarios. To gather sufficient knowledge for interpreting a BNP value, one must have a basic understanding of the spectrum of NP physiology and pathology.

This review article aims to provide an overview of the structure and function of NPs in general and, when applicable, BNP specifically. The assays currently available for BNP and *N*-terminal pro-BNP are discussed in relation to their use at Kaiser Permanente (KP) Northern California. Some of the accepted as well as the newer applications of BNP or other NPs are also discussed.

Structure of B-Type Natriuretic Peptide

Cardiac NPs are just one among many families of NPs. The cardiac NPs (also called atrial NPs from their original description of synthesis location) are produced from three different genes and are stored as prohormones. These are the 126–amino acid atrial natriuretic peptide (ANP), 22-amino acid C-natriuretic peptide (CNP), dendroapsis natriuretic peptide (DNP) and V-type natriuretic peptide (VNP). The 108-amino acid BNP is not stored as a prohormone. Other NPs include guanylin, uroguanylin, adrenomedullin, and urodilantin (renal NP). The BNP molecule consists of 32 amino acids attached by a cystine bridge with an *N*-terminal and a *C*-terminal. An understanding of the structure of the molecule is important because assay measurements are based on the recognition of certain areas within the molecule (Figure 1). All of the NPs, with the exception of adrenomedullin, share important structural elements that are required in receptor mediated cell signaling. There is a common 17–amino acid ring structure that shares a high degree of homology among the family members. The differences between members of the family are within the *N*- and *C*-terminal portions, and it is thought that this difference may play a role in the function of the particular peptide.[2, 3]

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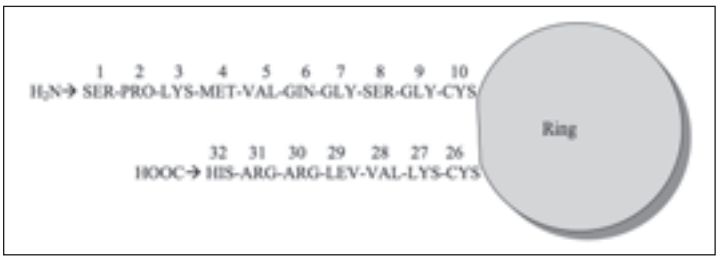

Figure 1. Schematic structure of B-type natriuretic peptide beginning at the *N*-terminal end and ending at the *C*-terminal, with amino acids 11 through 25 comprising the ring.

Biosynthesis and Secretion of B-Type Natriuretic Peptide

BNP is released as a 134–amino acid precursor, pre–pro-BNP. Original thought was that further breakdown resulted in the active 32–amino acid BNP and the inactive 76–amino acid *N*-terminal pro-BNP. However, this simplistic scenario has undergone a paradigm shift (Figure 2). Recent studies using Western blot analysis have characterized both low- and high-molecular-weight forms of BNP. Once BNP is in the circulation, numerous BNP fragments are noted, with each having various biologic activities.[4]

Release of BNP occurs in a secretory fashion constitutively (continuous transcription and translation of its gene that is determined by left ventricular pressure and volume overload) and in a pulsatile fashion through coronary sinuses (in response to left ventricular [LV] wall stretch, volume overload, and tissue hypoxia, along with multiple neurohumoral factors).[2,3,5] Regulation of BNP synthesis and secretion occurs at the gene level. BNP is not stored in secretory granules.[6] ANP, however, is stored in secretory granules. It responds to atrial stretch by secreting previously synthesized ANP and also increasing ANP gene transcription, which results in messenger RNA abundance. Because of the difference in constitutive versus pulsatile secretion, it is thought that BNP may provide a better index of LV mass and load and that ANP gives better information on volume status in normal renal function.[2] The genes for ANP and BNP are located in close proximity on chromosome 1.

Location, Stimulus for Release and Systemic Effects of Natriuretic Peptides

ANP and BNP are predominantly located in the cardiac atria and ventricle respectively. BNP is found in atrial and ventricular tissue. Due to the larger mass of the ventricle, there is an increased concentration produced from the ventricles. Both ANP and BNP decrease plasma volume and blood pressure in response to an increased tension of the respective cardiac chamber. CNP is found in the heart, brain, kidney and vasculature. The primary effect of CNP is venodilatation. CNP lacks significant natriuretic and diuretic action when infused into humans.

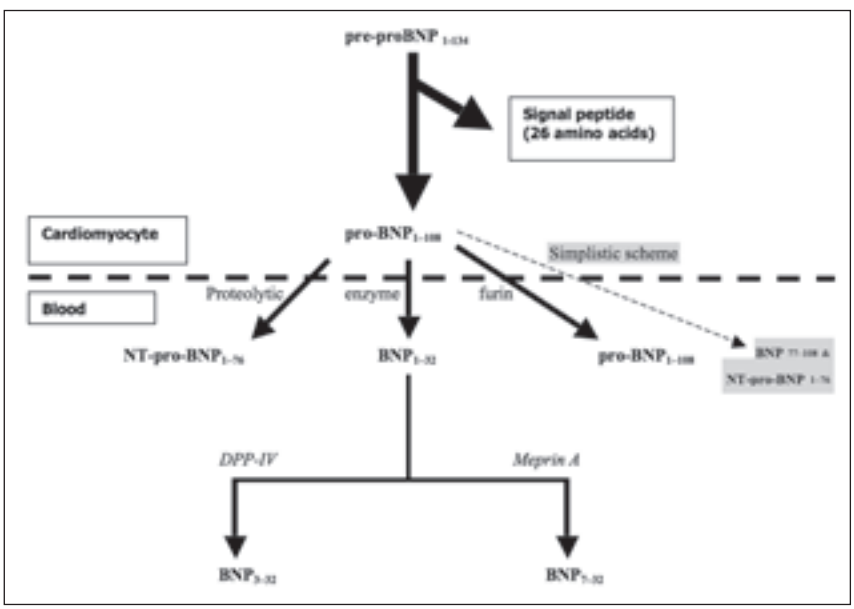

Figure 2. Simplistic scheme (in gray highlight). Prior model regarding B-type natriuretic peptide (BNP) release was that only two products of pro-BNP were released: BNP (active) and *N*-terminal-pro-BNP ([NT-pro-BNP] inactive). The current paradigm of natriuretic peptide (NP) synthesis and release consists of a variety of peptides released into bloodstream, each with varying biologic activity. NP location and release has not been fully elucidated.

BNP = B-type natriuretic peptide; NT-pro-BNP = *N*-terminal-pro-BNP; DPP-IV = dipeptidyl peptidase–IV.

Reprinted and adapted from the American Journal of Cardiology 2008 Feb 4, Supplement 1, 101(3A), Martinez-Rumayor A, Richard M, Burnett JC, Januzzi JL Jr, Biology of the natriuretic peptides, p 3-8, Copyright 2008, with permission of Elsevier.[4] Available from: www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6T10-4RR606X-5&_user=6774829&_coverDate=02%2F04%2F2008&_alid=769284664&_rdoc=1&_fmt=high&_orig=search&_cdi=4876&_docanchor=&view=c&_ct=1&_acct=C000061869&_version=1&_urlVersion=0&_userid=6774829&md5=64832291ac574f09248cd33a7f9a48cf.

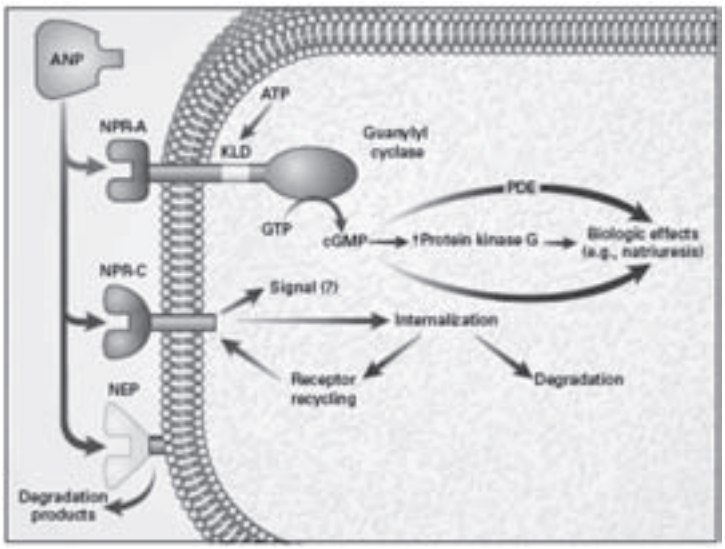

Figure 3. Action of atrial natriuretic peptide (ANP) at target cells. Binding of ANP to natriuretic peptide receptor A (NPR-A) and, in an ATP-dependent fashion, stimulating the intrinsic guanylyl cyclase activity of the receptor. Cyclic guanosine monophosphate (cGMP) exerts its biologic effects. ANP binds to natriuretic peptide receptor C (NPR-C), after which it is internalized and degraded. The C-receptor may also have independent signaling functions. Finally, ANP may be degraded by the extracellular neutral endopeptidases (NEPs) in the kidney and vasculature.

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CNP also possesses more potent antiproliferative and collagen-suppressing properties in cardiac fibroblasts as compared with ANP or BNP. DNP, which was discovered in 1992, acts as a potent natriuretic and diuretic. It also possesses cardiac unloading actions but at the cost of significant hypotension. The stimulus for release of DNP is not fully understood. Guanylin and uroguanylin which are presumed to arise from the gastrointestinal mucosa are thought to regulate salt and water transport (see Table 1).[2] Incorporating part of CNP and BNP, the novel chimeric peptide CD-NP was recently synthesized. The properties of CD-NP appear to be attractive in patients with the cardiorenal syndrome.[7]

Location and Ligand Specificity of Natriuretic Peptide Receptors

The mechanisms of action of the NPs are mediated by high-affinity NP receptors (NPR)-A and NPR-B.[2,6,8] All receptors share a relatively common molecular configuration, consisting of an extracellular binding site, a transmembrane sequence, and an intracellular domain (Figure 3). The actions of each of the NPs are determined by the binding specificity of the receptor to the ligand. This is important to know as systemic effects may be varied based on the specificity of the ligand to its receptor and the tissue distribution of the receptor.

The tissue distribution of NPR-A is within the kidney, adrenal, endocardial, brain, lung, and aorta. The ligand specificity of the receptor is highest to ANP and least to CNP with specificity of BNP between the other two. NPR-B is located

Table 1. Natriuretic peptide origin, stimulus for release and biologic effect[a]

Natriuretic peptide	Location(s) of peptide	Stimulus	Effect
ANP	Cardiac atria	Increased atrial stretch and tension	Decreased plasma volume and blood pressure
BNP	Cardiac ventricle	Increased ventricular wall tension	Decreased plasma volume and blood pressure
CNP	Heart, brain, kidney, vasculature	Shear stress	Vasodilatation, possibly acts as system neurotransmitter
D-type natriuretic peptide	Unknown	Unknown	Vasodilatation
Guanylin Uroguanylin	Gastrointestinal mucosa	Unknown	Regulates salt and water transport
Adrenomedullin	Adrenal medulla, cardiac ventricles, lungs, and kidneys	Unknown	Reduction in plasma volume, blood pressure, vasodilatation

ANP = atrial natriuretic peptide; BNP = B-type natriuretic peptide; CNP = C-natriuretic peptide.

[a] Adapted from: Joffy S, Rosner MH. Natriuretic peptides in ESRD. Am J Kidney Dis 2005 Jul;46(1):1-10.[2] Reprinted from the American Journal of Kidney Diseases, Vol 46, Joffy S, Rosner MH, Natriuretic peptides in ESRD, 1-10, Copyright Elsevier, 2005.[2]

Table 2. Ligand specificity, second messenger and tissue distribution of natriuretic peptide receptors[a]

Receptor	Ligand Specificity	Tissue Distribution
NPR-A	ANP>BNP>>CNP	Kidney, adrenal, endocardium, brain, lung, aorta
NPR-B	CNP>>ANP>BNP	Kidney, adrenal, cerebellum, pituitary, lung
NPR-C	CNP>ANP, BNP	Widely distributed

NPR = natriuretic peptide receptors; ANP = atrial natriuretic peptide; BNP = B-type natriuretic peptide; CNP = C-natriuretic peptide.

[a] Adapted from: Joffy S, Rosner MH. Natriuretic peptides in ESRD. Am J Kidney Dis 2005 Jul;46(1):1-10.[2] This article was published in the American Journal of Kidney Diseases, Vol 46, Joffy S, Rosner MH, Natriuretic peptides in ESRD, 1-10, Copyright Elsevier, 2005.[2]

within the kidney, adrenal, cerebellum, pituitary, and lung. The ligand specificity is highest to CNP and less to ANP and BNP. NPR-C has a wide tissue distribution with CNP having the highest ligand specificity. A simple method of remembering ligand specificity to an individual receptor could be ABC for NPR-A and CAB for NPR-B and C. The second messenger for both NPR-A and NPR-B is cyclic-GMP (see Table 2).[2] One example of receptor specificity is the lack of a renal natriuretic effect of CNP even after direct injection into the renal artery. This may be due to a lack of binding by NPR-A located in the inner medullary collecting duct of the kidney.[2]

Clearance of Natriuretic Peptide Receptors

Clearance of the NPs is by NPR-C. The NPs bind to the receptor and then are internalized and enzymatically degraded. Subsequently, the receptor returns to the cell surface. This process occurs primarily in the kidneys. Approximately 30% of the time the degradation is by neutral endopeptidases that are present within vascular and renal tubular cells.[7] Both BNP and NT-pro-BNP have been found in urine. The exact mechanism of clearance of NT-pro-BNP is not known. It appears to be cleared not by active clearance mechanisms but instead by organ beds with increased blood flow (muscle, liver, renal, etc). Renal extraction ratios for both BNP and NT-pro-BNP are 15% to 20% respectively.[9]

What Is a Normal Level of B-Type Natriuretic Peptide?

A normal BNP level is thought to be less than half the chronologic age of the patient.[10] BNP levels vary in health and are slightly higher in women than in men. The exact reason is unclear, but it is speculated that ventricular stiffening is more pronounced in females at all ages. BNP levels are 40% lower in obese individuals than those of normal body weight, either because of impaired production or increased peripheral clearance.

Abnormal Levels of B-Type Natriuretic Peptide and Conditions That Cause Increased B-Type Natriuretic Peptide Levels

It is thought that in the context of patients presenting with dyspnea and a BNP level <100 pg/mL, the diagnosis of heart failure is highly unlikely (~2%). A diagnosis of heart failure is highly likely with a BNP value >500 pg/mL (~95%). A value between 100 and 500 pg/mL renders a diagnosis of heart failure as probable (~90%). There are many conditions that cause an increased BNP level, such as advancing age. Women have higher slightly higher levels than men. Cirrhosis of the liver is associated with BNP levels three times higher than normal. Renal failure, further described later in this article, is associated with increased BNP levels. Primary pulmonary hypertension, pulmonary embolism, primary hyperaldosteronism, and Cushing syndrome are associated with increasing BNP levels. Other cardiac conditions besides congestive heart failure (CHF) associated with increased BNP levels are cardiac inflammatory processes: myocarditis, cardiac transplant rejection, Kawasaki disease, and LV hypertrophy.[8,10]

Natriuretic Peptide Assays

According to Panteghini and Clerico, "Several methods for cardiac natriuretic hormone determination have been proposed measuring similar or identical peptides, showing, however, different analytical performance, reference values, clinical results and possibly diagnostic accuracy. In addition, there is no general agreement about the cardiac natriuretic hormone terminology used by different researchers and manufacturers; this may increase confusion and cause misleading interpretation."[11] There appears to be an attempt to try to rectify this confusion. A report recently published by the Committee on Standardization of Markers of Car-

... ANP and BNP decrease plasma volume and blood pressure in response to an increased tension of the respective cardiac chamber.

diac Damage of the International Federation of Clinical Chemistry and Laboratory Medicine, meant primarily for manufacturers but helpful for all who use BNP or NT-pro-BNP assays, addressed the variety of factors that contributed to inconsistencies. Analytic factors that were addressed by this committee included the type of antigen used for calibration, assay specificity and imprecision, and interferences by factors such as hemoglobin and bilirubin or by heterophilic antibodies. Preanalytic factors that were addressed included sample type (serum, plasma, whole blood, and type of specimen collection tubes) and sample stability at different temperatures of storage.

First-generation commercial assays for ANP and BNP—those available before 1990—were competitive immunoassays. These were radioimmunoassay (RIA) and enzyme immunoassay (EIA) methods. Both of these methods required a preliminary purification chromatographic step because of their poor sensitivity and specificity, which subsequently decreased assay precision and practicability. Second-generation immunoassays that became available during the 1990s were noncompetitive immunoassays (immunoradiometric assays, or IRMAs). These did not require a purification step, but the long turnaround time did not allow their use in time-sensitive scenarios.

Noncompetitive IRMA methods have been set up to overcome the problems with the earlier BNP assays. This method uses a two-site sandwich method, employing two specific monoclonal antibodies or antisera against two remote epitopes on the ANP or BNP molecule. These can be based on a solid-phase or liquid-phase system as the means for separation. The advantages of IRMAs versus RIAs are that

- IRMAs use radiolabeled antibody, which is more stable than radiolabeled ANP or BNP
- IRMAs do not require the purification step because of their increased sensitivity and are not affected by specific or nonspecific interferences
- IRMAs use lower plasma volumes.

One of the drawbacks of the IRMA method is that it uses two monoclonal antibodies that are specific for the intact ANP or BNP molecule. However, it is possible that the intact pro-BNP or pro-ANP molecule will also contain the biologically active component, resulting in measurement of both these components. The second drawback is the result of falsely low levels of BNP, despite the clinical scenario, that would

Table 3. Assays for BNP and NT-pro-BNP

Marker	Company	Available at Kaiser Permanente–Northern California	Cost/test[a]	Initial technology	Current fully automated assays Calibrator material, capture antibody, detection antibody
BNP	Abbott AsSYM	Was run by regional laboratory	$36.00	Microparticle enzyme immunoassay	BNP_{1-32} synthetic peptide (Peptide Institute), Abbott (amino acids 5-13), Shionogi (C-terminus)
BNP	Bayer ADVIA Centaur ACS : 180	Initially run by Quest	$96.00	Direct chemiluminescent sandwich immunoassay	BNP_{1-32} synthetic peptide (Phoenix Pharmaceutical), Scios (ring), Shionogi (C-terminus)
BNP Triage BNP	Biosite, Inc	No		Single-use fluorescence immunoassay device (point-of-care testing)	
BNP	Biosite, Inc Beckman Access	May be available at all local laboratories in near future	$12.00	Two-site chemiluminescent immunoenzymatic assay	BNP_{1-32}recombinant peptide (Scios), Scios (ring), Biosite (*N*-terminus)
NT-pro-BNP Elecsys	Roche Diagnostics	May be available		Electrochemiluminescent immunoassay	NT-pro-BNP_{1-76} synthetic Peptide, (Roche), Roche (*N*-terminus), Roche (amino acids 39–50)

BNP = B-type natriuretic peptide; NT-pro-BNP = *N*-terminal-pro-BNP.

[a] Cost/test is the approximate cost of the test.

suggest otherwise (eg, CHF, renal insufficiency). This phenomenon is known as the hook effect, which occurs during RIA, when the antibody-binding sites become saturated and the binding curve is no longer proportional to the actual level of BNP. The hook effect can be resolved by using a monoclonal antibody coated onto the solid phase showing high binding capacity.

Subsequently newer generation immunoassays, including point-of-care testing, use noncompetitive sandwich immunoassays. These do not use radioactive materials as labels for the antigen/antibody reaction. Instead they use monoclonal antibodies, polyclonal antibodies or a combination for BNP binding. One antibody binds to the ring structure and the other to either the *C*- or *N*-terminal end of BNP. These methods have allowed their use as a point of care method/emergency situations (see Table 3).

Uses of B-Type Natriuretic Peptide

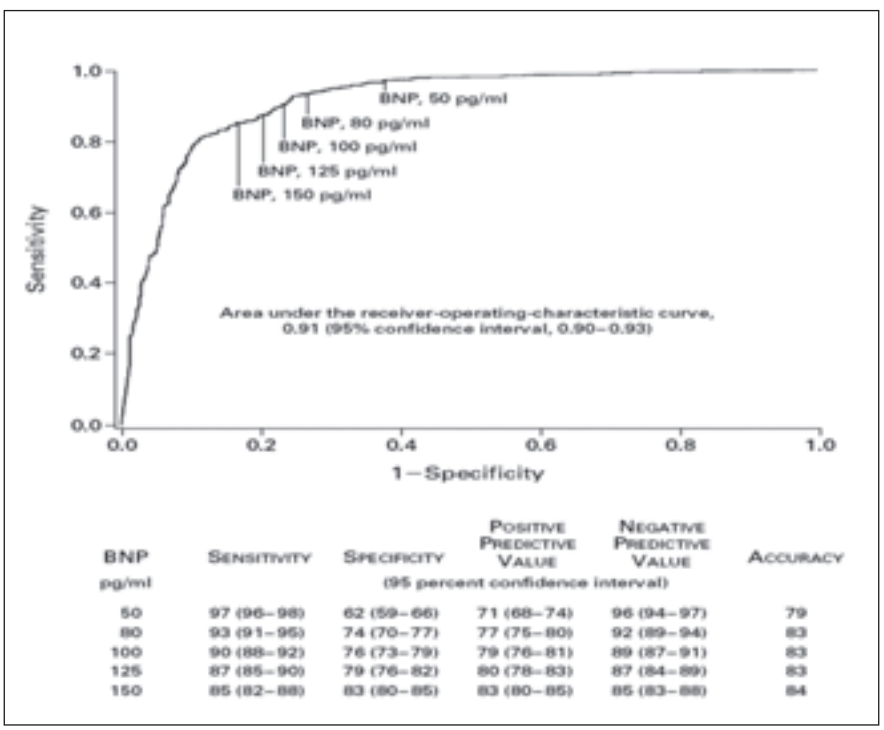
There have been numerous studies using BNP in various settings. Silver and colleagues[10] suggested a hub-and-spoke model of applications using BNP testing. BNP is the center hub, with the spokes being screening, diagnosis, prognosis, therapy, and treatment monitoring.

Screening

There are currently no data to support the use of BNP as a screening tool.[10] Therefore, the decision to order a BNP test should be based on cardiac risk factors and symptoms.

In the Emergency Department

Three clinical trials have assessed the value of BNP as an additive tool to the history, physical examination, and chest radiograph. One of the initial pilot studies, originating from the group in San Diego, CA, provided preliminary data for the subsequent large, seven-center study. The Breathing Not Properly study[12] enrolled 1586 patients who were being evaluated in an Emergency Department (ED) for shortness of breath. It showed that BNP used in conjunction with other clinical information was useful in differentiating the etiology shortness of breath. Patients with a diagnosis of acute CHF had a median BNP level of 675 ± 460 pg/mL (n = 744), whereas those patients without CHF had a BNP level of 110 ± 225 pg/mL (n = 770), and the 72 patients who had LV dysfunction at baseline but no acute exacerbation had a BNP level of 346 ± 390 pg/mL. It is apparent by the data that there was overlap between patients in each group. Receiver-operating characteristic (ROC) curves are meant to judge where to draw the line between normal and abnormal to obtain the maximum sensitivity and specificity. In the Breathing Not Properly study, the recommended cutoff was 100 pg/mL on the basis of the ROC curve, but some believe that a better cutoff in view of the study's data might be 150 pg/mL, on the basis of a sensitivity of 85%, specificity of 83%, positive predictive value of 83%, and negative predictive value of 85%, with an accuracy of 84% (Figure 4).



BNP pg/ml	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	Accuracy
	(95 percent confidence interval)				
50	97 (96–98)	62 (59–66)	71 (68–74)	96 (94–97)	79
80	93 (91–95)	74 (70–77)	77 (75–80)	92 (89–94)	83
100	90 (88–92)	76 (73–79)	79 (76–81)	89 (87–91)	83
125	87 (85–90)	79 (76–82)	80 (78–83)	87 (84–89)	83
150	85 (82–88)	83 (80–85)	83 (80–85)	85 (83–88)	84

Figure 4. Receiver-operating characteristic curve for various cutoff levels of B-type natriuretic peptide (BNP) in differentiating between dyspnea due to congestive heart failure and dyspnea due to other causes.

BNP = B-type natriuretic peptide.

Reprinted from Maisel AS, Krishnaswamy P, Nowak RM, et al; Breathing Not Properly Multinational Study Investigators. Rapid measurement of B-type natriuretic peptide in the emergency diagnosis of heart failure. N Engl J Med 2002 Jul 18;347(3)161–7.[12]

The second study, the REDHOT [13] trial, also originated from the San Diego group. This trial recruited 464 patients from ten sites and assessed the relationships between BNP levels within a diagnostic range, clinical decision making, and outcomes. It showed that there was a difference between perceived severity of CHF by ED physicians and the severity as determined by BNP. The presumption was that if ED physicians had access to BNP data at the time of the patient presentation, an improvement of the triage of patients would have resulted.

The third study, by a Swiss group, was called the BASEL[14] study and was a prospective, randomized, controlled clinical trial that enrolled 452 patients presenting to the ED with acute dyspnea. Of those, 225 patients were assigned to a strategy that measured BNP with a rapid bedside assay and 277 were randomized to a standard treatment (not using BNP). The median number of days to discharge and total cost of treatment were the primary endpoints. The time to treatment was 63 minutes in the BNP group and 90 minutes in the control group (p = 0.03). The number of days in the BNP group was 8.0 days and 11.0 days in the control group. The median total treatment cost was $5410 in the BNP group and $7264 in the control group.

BNP values reflect LV function, mass, and load more than volume status.[2]

A substudy from the original Breathing Not Properly study suggested that BNP should be taken into context with the presenting clinical scenario.[15] The diagnostic accuracy of clinical judgment was 74.0%, the accuracy when BNP was >100 pg/mL was 81.2%, and a combination of BNP data and clinical judgment yielded a diagnostic accuracy of 81.5%.

The results of these studies suggest that:

- BNP can be used as a triage tool in the ED in patients presenting with dyspnea to help with ascertaining the diagnosis
- Increased diagnostic accuracy will be attained when the combination of BNP data and good clinical judgment
- There may be some cost-effectiveness to this strategy.

Management of Congestive Heart Failure

Studies using BNP to guide the effectiveness of therapy in patients with heart failure have been reported. For example, the Val-HeFT and RALES trials suggested that valsartan and spironolactone lowered BNP levels in patients with heart failure. The STARS-BNP[16] study, evaluated patients with New York Heart Association (NYHA) class II to III CHF whose ejection fraction was <45% and who were in stable condition and treated by optimal medical therapy. Patients were randomized to a BNP group and a clinical group for assessment of whether BNP-guided therapy (target BNP <100 pg/mL) would affect outcome in this population. The BNP group had an increased number of changes in medications (the highest changes were in diuretics and β-blockers) and an increased event-free survival period between the two groups at 450 days. The mean BNP levels in the BNP group had a statistically significant decrease at three months when compared with baseline BNP (from 352 ± 260 pg/mL to 284 ± 180 pg/mL). It is to be noted that the target BNP of <100 pg/mL was reached in only 16% of patients at baseline and in 33% of patients by a follow-up examination at three months, suggesting that lowering BNP to a predefined level may be impractical. The inability to lower BNP may be a reflection of basal constitutive secretion due to factors already mentioned. A recent study suggested that patients with nonischemic dilated cardiomyopathy, admitted for decompensated heart failure with elevated BNP levels >190 pg/ml, six-months after admission had a worse prognosis.[17]

B-Type Natriuretic Peptide in Renal Insufficiency

Renal insufficiency is a spectrum of disease that can be characterized on the basis of glomerular filtration rate as chronic kidney disease (CKD) stages 1 through 5. Most physicians have noted in their daily practice that BNP levels appear to be higher in patients with CKD. One of the primary trials to evaluate BNP in the setting of CKD was the Breathing Not Properly study. This study established that BNP levels in patients with CKD should not be interpreted without the corresponding clinical scenario. It also suggested that the cutoff points for BNP in patients with CKD and CHF should be higher. The cutoff point of 200 pg/mL with a glomerular filtration rate of <60 mL/min was thought to be a balancing point for diagnostic utility. This will still maintain a high diagnostic sensitivity with an area under the ROC of >0.807.[10]

The individual contributions of CHF and renal failure to the total level of BNP are unknown. These two diseases are known to be highly salt- and water-retentive states. In CHF, there is

an increased production of NPs to overcome this retentive state. With the advent of progressive renal failure, there is increased production but also decreased degradation and hyporesponsiveness of NPs because of postulated reasons such as renal hypoperfusion and activation of the renin-angiotensin-aldosterone and sympathetic nervous systems. Cardiac transplantation is not known to decrease BNP values for multiple reasons that include advanced age, decreased renal function, and the presence of hypertension.[2] BNP levels >250 pg/mL in chronic cardiac transplant survivors was closely related to allograft failure and development of coronary artery disease and had an increased likelihood of death.[18] Successful renal transplantation, however, lowers elevated levels of NPs.[19]

In patients who have CKD stage 5 (receiving renal replacement therapy by hemodialysis [HD]), the exact role of the NPs are unclear. The natriuretic effect is minimal, but the strength of other effects, such as antifibrotic or antiproliferative, is unknown. There does not appear to be any known endogenous clearance of these peptides. A sevenfold elevation of BNP and a fourfold elevation of ANP were noted before HD in patients with CKD stage 5 when compared with study control subjects. HD decreased ANP levels by 36% and BNP levels by 9%. Final concentrations of both were still significantly higher than in study control subjects. Another study showed that ANP and BNP levels were the highest in patients receiving HD when compared with patients with CKD not receiving HD or with cardiac transplant patients. Levels of BNP as compared with levels of ANP decreased less after HD (16% vs 43%).[19]

The determination of dry weight has been suggested as a use of ANP or BNP. Numerous studies have sought to define the exact role of ANP or BNP in the determination of dry weight. Confounding variables such as concomitant valvular disease and arteriovenous fistulas (increase ANP and BNP levels) influence levels of NPs in this determination. To summarize, ANP levels before dialysis have a good correlation with volume overload but levels after dialysis are not reliable for dry weight determination. BNP values reflect LV function, mass, and load more than volume status.[2]

Prognosis

A discussion of the use of BNP in assessing prognosis is beyond the scope of this article, but some examples of its use in prognosis are mentioned here. In the Val-HeFT[9] trial, outpatients with the highest quartile of BNP levels (>238 pg/mL) had the highest mortality. Its use in acute coronary syndrome has not been shown to predict ischemia but has been shown to be a powerful tool for obtaining prognostic information. The OPUS-TIMI 16 trial[20] showed that the combination of troponin+ (troponin >0.04 ng/mL) and BNP+ (BNP >485 pg/mL) had a relative risk of >12 and a mortality rate approaching 45%. One of the most intriguing and provocative uses of BNP is in trying to determine the risk of sudden cardiac death in patients with CHF. Berger and colleagues[21] sought to determine the risk of sudden cardiac death by using BNP values in approximately 450 patients with mild to moderate CHF (ejection fraction <30%) classified as NYHA class I or class II. He found that BNP levels >130 pg/mL separated patients into high versus low rates of sudden death. Only 1% (1 of 110) of patients with BNP levels <130 pg/mL died suddenly, compared with 19% (43 of 227) with BNP levels of >130 pg/mL. Further work is needed before we can use BNP as a guide to defibrillator placement in those patients with CHF.

Clinical Utility of Natriuretic Peptides in Aortic Stenosis and Mitral Regurgitation

An emerging use of NPs, specifically BNP, NT-BNP, NT-pro-BNP, and ANP, have been directed toward the determination of functional class, assessing the relation of NP levels with invasive and noninvasive measurement, timing of surgery, and prognosis for patients with aortic stenosis (AS)[22-31] or mitral regurgitation (MR).[32-28] There is also an attempt to correlate NP levels with the underlying ultrastructural changes that the left ventricle faces with either pressure or volume overload in patients with AS or MR. The use of NPs may become part of mainstream clinical management in this subgroup of patients in the future. However, with the wide variations in the assays used and the cohort selected by the initial studies, generalized applicability in its use is currently not recommended.

Gerber and colleagues[22] selected three NPs in one of the first articles that examined the use of NPs in the assessment of patients with AS. They were BNP, N-terminal BNP and ANP. The study cohort was 74 patients with isolated AS. All three NP levels correlated with NYHA functional class and aortic valve area. BNP, ANP and N-terminal BNP levels

increased with increasing NYHA functional class. The median BNP level (expressed in pmol/L) in NYHA class I was 8 (range, 6–14), in NYHA class II was 25 (range, 13–35) and NYHA class III/IV was 40 (range, 18–66). When divided into asymptomatic and symptomatic groups, all the NP levels measured increased in the symptomatic group. N-terminal BNP of 60 pmol/L and a BNP value of 14 pmol/L were the cutoffs for maximum sensitivity and specificity for the presence of symptoms. Gerber et al[23] also assessed NT-pro-BNP in 29 initially asymptomatic patients with aortic stenosis and suggested the NT-pro-BNP above normal limits suggested the future development of symptoms. Lim and coworkers[24] showed that a BNP cutoff value of 66 pg/mL was able to detect the presence of symptoms with a sensitivity of 84%, specificity of 82%, and accuracy of 84%. Angina was not associated with elevated BNP levels. A Kaplan-Meier survival curve suggested a BNP value >97 pg/mL as an indicator of survival at a follow-up point of 308 days (range, 11–472 days). Berger-Klein and colleagues[25] suggested a benefit of serial measurement of NPs (BNP, *N*-terminal BNP, *N*-terminal ANP) in patients with aortic stenosis AS to determine timing of conversion from an asymptomatic to symptomatic status. Prognostic information was also available, and suggested BNP levels >130 pg/mL in this subgroup of patients with AS had worse outcomes. Preoperative *N*-terminal BNP levels were significant predictors of postoperative symptomatic status also. Nessmith and colleagues[26] monitored patients who did not undergo aortic valve replacement. BNP values <296 pg/mL, between 296 and 819 pg/mL, and >819 pg/mL resulted in one-year mortality rates of 6%, 34%, and 60%, respectively, and BNP value of 190 pg/mL discriminated between the presence and absence of symptoms. Kupari and colleagues[27] studied 49 patients undergoing cardiac catheterization for isolated AS. Blood samples were obtained from the aortic root and coronary sinus for *N*-terminal BNP. An increase in the transcardiac plasma *N*-terminal BNP in patients with diastolic heart failure (threefold increase) and systolic heart failure (sixfold increase) from that of study control subjects and patients with AS without heart failure suggest a spectrum of stages that patients with AS go through, and NPs may aid in identifying these stages. A recent article regarding the TOPAS study[28] suggested that NPs (BNP) in the TOPAS study can be used to differentiate the truly severe from the pseudo severe stenosis in low gradient AS, and its use here has prognostic ability in determining survival from aortic valve replacement.

NPs have also been used in patients with MR to correlate functional status,[29] severity of valvular regurgitation, and prognosis. There has been again a variety of NPs that have been used, with varying assays for the detection of these peptides, different methods for determining MR, and differences in the patient cohort making the assessment difficult of where this clinical tool will fit in the clinical care of these patients. Sutton and coworkers[30] assessed the use of ANP, BNP, and *N*-terminal-BNP in 49 patients with isolated MR and preserved LV systolic function. Symptomatic patients had higher levels of all three NPs and had an increased severity of MR. In the symptomatic patients with MR, BNP was 16.9 pmol/L (range, 13.3–21.4 pmol/L), compared with 7.1 pmol/L (range, 6.0–8.4 pmol/L) for the asymptomatic patients. Mayer and coworkers[31] attempted to assess how BNP values can be interpreted in patients presenting with the clinical diagnosis of heart failure using the Framingham criteria in those with and in those without associated MR. They noted a median BNP value of 826 pg/mL (range, 410–1300 pg/mL) and a mean ejection fraction of 37% ± 17%. Patients with increased BNP levels had associated increased LV end-diastolic, end-systolic dimensions, lower LV ejection fraction, and increasing MR severity ($p = 0.024$). In patients in whom diastolic heart failure had been diagnosed, all subgroups had higher BNP values, with restrictive filling pattern having the highest BNP levels (925 ± 52 pg/mL).

The Mayo group[32] made some key observations that enabled progression of this field of study. First, they noted as before that when stratified by NYHA functional class, BNP levels increase significantly with symptom severity and with severity of MR. It should be noted, however, that within each class of symptoms there was a wide range of BNP levels with large overlap between classes. Second, using indexed and nonindexed volumes (left atrial volume, LV end-diastolic volume index, LV end-systolic volume index), they showed a significant correlation between volumes and BNP levels. Third, they also noted the use of BNP had prognostic value. A BNP level of >31 pg/mL versus <31 pg/mL predicted survival (at five years, 42% ± 10% versus 16% ± 7%; $p = 0.03$). Using volumetric analysis, they believed that BNP

reflected the hemodynamic, atrial, and ventricular burden placed by the presence of MR. A subsequent study by the same group noted that functional MR had greater BNP activation than organic MR did. Organic MR was defined as being present if the MR was due to intrinsic valvular disease with at least a moderate degree of regurgitation (regurgitant fraction >40%). Functional MR was associated with a low ejection fraction (<50%) and structurally normal cardiac valves. Two studies reported in 2007 suggested that the ratio of BNP to ANP may be useful in determining the severity of MR[33] and that the use of plasma BNP may correlate well with the myocardial performance index,[34] which has been shown to be a useful parameter in assessing patients with MR.

Brief Overview of *N*-Terminal-pro-B-Type Natriuretic Peptide

A complete review of NT-pro-BNP is beyond the scope of this article, but a brief overview of the concepts and current theories regarding the subject follows. The June 2005 issue of the *Journal of Cardiac Failure*[35] and the February 4, 2008, supplement to the *American Journal of Cardiology*[36] devoted their entire issue to NT-pro-BNP. It appears that there is no significant evidence to suggest that either BNP or NT-pro-BNP is superior to the other. The differences between the two are based on the principles outlined earlier. Some points that must be considered in choosing which assay (BNP or NT-pro-BNP or other yet undetermined assays) should be used by KP:

What is the clinical scenario in which the assay is going to be primarily used—as a screening tool, for diagnosing shortness of breath, as a follow-up diagnostic tool after heart failure? It is assumed that different clinical scenarios will give rise to different output of individual NPs. Knowledge of the scenario and the assay are important.

With the new paradigm of NP synthesis and release and knowledge of varying biologic activities, we must ask what specific peptide are we trying to measure? Will we be measuring a biologically active or an inactive peptide?

With the constant change in knowledge of the biology of NPs, how will KP laboratories adapt?

Summary

The NPs are extremely complex families of peptides that have numerous responsibilities. Among them are the maintenance of sodium and water homeostasis and vasomotor tone. The pathways for regulating these functions are located in a variety of end organs. Resistance to the effects of cardiac natriuretic hormones can also occur due to prereceptor, receptor, and postreceptor factors.[4] Assays have been developed to capture NP levels at a certain point of time within the natural history of a disease. These assays also help us to understand the physiology and pathology of NPs. However, with an insufficient knowledge of the fate of the NPs and their end products, as well as of cross-reactivity of the assays between active and nonactive components, the stage is set for inappropriate interpretation of the NP that has been assayed.

BNP and the other NPs have shown promising results in a variety of clinical scenarios. When using BNP, the clinician should be sure to understand the clinical context in which it is measured and to ask what the current BNP value reflects. The physician in the ED may ask whether the presenting patient's symptoms are indeed heart failure or are instead pulmonary based. The cardiologist may want to know whether BNP reflects ultrastructural LV changes in patients with AS or MR. The electrophysiologist may want to further risk-stratify patients presenting for empiric placement of an implantable cardioverter defibrillator to assess their risk of sudden cardiac death. BNP appears to be a finicky diagnostic tool. However, that finicky nature may be better withstood, if there is an understanding of the NP physiology and also an understanding of the lack of standardizations in assays currently available. With the large number of laboratories within KP Northern California, a variety of assays have been used with possible resultant confusion. These will have to be eventually standardized in the future. As assays continue to be further developed, we must be cognizant of the changing landscape and make adjustments as needed, to ensure adequate representation of the clinical scenario by the NP we are seeking to determine. ❖

Disclosure Statement

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

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Health And Sickness

Health and sickness, like strength and weakness, are not simple, sharply divided conditions, but very complex, highly involved and relative conditions, with no sharp borderlines. No one is absolutely or completely healthy, and no one is absolutely sick; everyone is in such a condition only more or less.

— The Value of Health to a City, *Max von Pettenkofer, 1818-1901, Bavarian chemist and hygienist*

"449"

4 x 5"
hand carved wood block engraving with black ink

By Sal Iaquinta, MD

Sal Iaquinta, MD, is a Head and Neck Surgeon at the San Francisco Medical Center in CA. He is a self-taught artist and began doing wood engravings a few years ago. His influences are Roy Lichtenstein, MC Escher, and Salvador Dali. A woodblock is carved for each color to be used in the print; the print is then made by building the colors one on top of the other with the final printing in black. In this case only one block was used.

This portrait of MC Escher is titled "449" because Escher only made 448 wood engravings, mezzotints, and lithographs. This engraving is the self-portrait he never made; it is modeled after a photograph taken late in his life.

Other engravings and paintings of Dr Iaquinta's may be viewed at: www.RockJWalker.com under the pseudonym "IQ"

REVIEW ARTICLE

Prognostic Factors for Long-Term Survival after Glioblastoma

Mohammad Sami Walid, MD, PhD

Abstract

Long-term survivors of glioblastoma (GB) are rare. Several variables besides tumor size and location determine a patient's survival chances: age at diagnosis, where younger patients often receive more aggressive treatment that is multimodal; functional status, which has a significant negative correlation with age; and histologic and genetic markers.

Introduction

Of the estimated 17,000 primary brain tumors diagnosed in the US each year, approximately 60% are gliomas.[1,2] Glioblastoma (GB), or grade IV astrocytoma, is the most aggressive of primary tumors of the brain for which no cure is available.[1,3] Management remains palliative and includes surgery, radiotherapy, and chemotherapy. With optimal treatment, patients with GBs have a median survival of less than one year.[1] About 2% of patients survive three years.[4] Previously reported long-term survivors (LTSs) of GB may have been patients who actually harbored other low-grade gliomas.[5] The overall prognosis for GB has changed little since the 1980s, despite major improvements in neuroimaging, neurosurgery, radiotherapy, and chemotherapy techniques.

Methods

LTSs are defined as those who survive longer than two years.[1] Despite extensive clinical trials, prediction of clinical outcome for individual patients has remained an elusive goal. In search of factors or predictors of long-term survival, we queried the literature using PubMed and Google and the keywords *glioblastoma prognostic factor long survival,* and then reviewed the articles, comparing their results for common findings.

Results

We found that patient survival depends on the following clinical and biologic parameters: tumor size and location, treatment, age at presentation, Karnofsky performance score (KPS) at presentation, histologic findings, and molecular genetic factors.

Tumor Size and Location

GB is a highly infiltrating tumor and most of the time cannot be resected completely; hence, surgery often consists of incomplete debulking. The feasibility and extent of surgical resection depends on tumor size and eloquence of the brain areas (location). Supratentorial and cerebellar tumors are more amenable to surgical treatment and thus carry better prospects than tumors in the brainstem or diencephalon. Stereotactic biopsy, followed by radiotherapy, may be a more appropriate treatment for these patients.[6] Case management with best supportive care for patients with unresectable, primary, biopsy-proven GB results in a median survival time of three months.[6,7]

Treatment

Clinical evidence suggests that an aggressive and multimodal treatment results in longer survival.[8–14] Total or subtotal resection, combined with radiotherapy and chemotherapy, is the mainstay of treatment. New therapies that are still under investigation have shown some promising results. For example, in a 2007 report of a study by Dehdashti et al, brachytherapy was used as a boost to radiotherapy: three patients lived 11, 16, and 18 years, respectively, in the basic group, but unfortunately, statistics did not reveal any significant association with brachytherapy.[15] In another example, temozolomide has recently proved to significantly prolong survival when used as an adjuvant chemotherapy to radiotherapy.[16] Regarding intra-arterial chemotherapy, a survival benefit in comparison with intravenous administration was not established.[17]

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Age at Presentation

Nearly all studies showed a significant negative relationship between advancing age and duration of postoperative survival.[8–18] In a 2005 report of a study by Korshunov et al,[18] the percentage of patients younger than age 40 years who survived more than five years was 34%, compared with 6% for patients age 40 years old and older. The researchers suggested age 40 years as the most appropriate cutoff for dividing patients with GB into groups according to prognosis.

Karnofsky Performance Score at Presentation

Many studies' findings show that higher KPS at presentation correlates with improved outcome.[4,15,19–21] This is most probably linked to the factor of younger age at diagnosis.

Tumor size and location, treatment, age at presentation, and KPS at presentation allow stratification of patients into risk groups. Using recursive partitioning analysis, Lamborn et al[22] identified four risk groups. The two lower-risk groups included patients younger than age 40 years, the lowest risk group being young patients with tumor in the frontal lobe only. An intermediate-risk group included patients with a KPS >70, subtotal or total resection, and between ages 40 and 65 years. The highest-risk group included all patients older than age 65 years and patients between ages 40 and 65 years with either KPS <80 or biopsy only. Subgroup analyses indicated that inclusion of adjuvant chemotherapy provides an increase in survival, although that improvement tends to be minimal for patients older than age 65 years, for patients older than age 40 years with KPS <80, and for those treated with brachytherapy.

... aggressive and multimodal treatment results in longer survival.[8–14]

Histologic Findings

The higher the grade of tumor, the more malignant the tumor is and the worse the prognosis is. Tumors are graded mainly on the basis of their proliferation index, which is an important prognostic factor in GB. The Ki-67 protein is expressed in all phases of the cell cycle except G0 and serves as a good marker for proliferation. Studies that have evaluated proliferation index by Ki-67 immunohistochemistry in GB have shown a significant correlation between high proliferation rates and shorter disease-free and overall survival.[5,12,13]

The cytologic and histologic composition of glioblastoma has an impact on survival. Microcystic change, the presence of cells with obvious astrocytic differentiation (fibrillary astrocytes), and the subjective impression that areas of better differentiation are present has been associated with a better outcome.[23] Another histologic factor, calcification, was in one study associated with a better prognosis.[24] A significant relationship also exists between the presence of necrosis and poor outcome.[23] Korshunov et al[25] found that some histologic and genetic markers that were significant for outcome appeared to be closely related to biology of single cytologic subsets (see "Molecular Genetic Factors"), so they divided GB into three cytologic subsets: small-cell GB (SGB), pleomorphic-cell GB (PGB), and gemistocytic GB (GGB).

Molecular Genetic Factors

Cytogenetic and molecular genetic studies of GB have shown that the most frequent alterations encountered in these tumors are loss of heterozygosity on chromosome arm 10q (60%–90%), mutations in p53 (25%–40%), *PTEN* mutations (30%), overexpression of MDM2 (10%–15%), and epidermal growth factor receptor (EGFR) gene amplification.[1] More p53 expression was reported in LTSs (>3 years) and overexpression of MDM2 in short-term survivors (<3 years).[26] Korshunov et al[25] found that the number of p53-positive tumors prevailed among the PGB, whereas the number of tumors with EGFR and MDM2 positivity was significantly greater in SGB. GGB contained the significantly lowest mean proliferating cell nuclear antigen (PCNA) labeling index (LI), greater number of p21^{ras}-positive cases, and higher mean apoptotic index (AI). Thus, there is a relationship between histologic and genetic markers. Survival time in patients with SGB, EGFR, and MDM2 positivity and PCNA LI >40% was found to be significantly shorter, whereas presence of p21^{ras} and AI >0.5% were associated with prolonged survival. In another study, Korshunov et al[18] found that being younger than age 40 years is strongly associated with a favorable prognosis. EGFR amplification, loss of 9p21, and gain of chromosome 9 had prognostic significance for all patients, whereas gain of chromosome 7 and loss of 10q23/*PTEN* showed clinical importance only for patients age 40 years and older. Krex et al[19] studied 55 patients with GB who lived more than three years. They found significantly more frequent O6-methylguanine–DNA methyltransferase (MGMT) hypermethylation in LTSs.[19] Interestingly, the protein product of MGMT gene, 06 alkylguanine–DNA alkyltransferase, was shown to be involved in tumor resistance to alkylating agents. Silencing of the

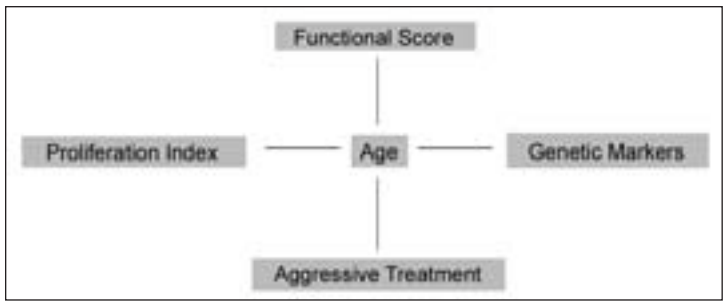

Figure 1. Interaction of prognostic factors for patients with glioblastoma.

MGMT gene by promoter methylation compromises DNA repair and has been associated with longer survival in patients with glioblastoma who receive alkylating agents.[27–30] Clinical trials for malignant gliomas now often include determination of MGMT expression status.

Recently, Marko et al[31] identified a set of 1478 genes with significant differential expression ($p < 0.01$) between long-term and short-term survivors and, with additional mathematic filtering, isolated a 43-gene "fingerprint" that distinguished survival phenotypes. Gene ontology analysis of the fingerprint demonstrated pathophysiologic functions for the gene products that are consistent with current models of tumor biology, suggesting that differential expression of these genes may contribute etiologically to the observed differences in survival.

Conclusion

GBS are highly malignant tumors that are difficult (but not impossible) to eradicate and that carry a dismal prognosis. LTSs are rare. Several factors besides tumor size and location determine patient's survival chances after diagnosis of GB. Age and functional status are two important prognostic aspects that seem to be correlated. Proliferation index and genetic markers have also been related to age.[32,33] Moreover, younger patients often receive aggressive and multimodal treatment. Thus, age at diagnosis plays a pivotal role in the prognosis for GB patients (Figure 1). ❖

Disclosure Statement

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Let The Brain Go

Man's brain is his uniquely human organ. Damage it and life loses its meaning in direct proportion, no matter what other physiologic benefits may occur in the process. The brain cannot be regenerated, repaired or homo-transplanted. It accumulates no metabolic debts and, unless supplied continuously by an effective circulation carrying large amounts of oxygen and glucose, it digests itself irreparably. This means that one cannot "let the brain go" while solving other medical problems … . The integrity of the nervous system must be the first goal of therapeutics.

— Disorders of the Nervous System and Behavior, *1971, Fred Plum, University Professor Emeritus, Department of Neurology, Weill Medical College of Cornell University*

CASE STUDY

An Unusual Case of a Cervical Mass Due to Nontuberculous *Mycobacterium Fortuitum* Infection

Hien Nguyen, MD
Connie Le, MD
Hanh Nguyen, MD

Abstract

Mycobacterium fortuitum, of the class of nontuberculous mycobacteria, rarely causes cervical lymphadenopathy and head and neck masses. However, we treated a woman with a neck mass that was indeed caused by a mycobacterial infection. Our case is unique in that prompt recognition of the infection and treatment with antimicrobials averted surgery. Generally, both antibiotics and surgery are recommended, and in rare instances, infections can resolve with antibiotics alone. Nontuberculous *M fortuitum* infection should be included in the differential diagnosis of cervical masses, particularly in immunocompromised patients or those for whom standard antibiotics are not effective for treating abscess or lymphadenitis.

Introduction

Atypical or nontuberculous mycobacterial (NTM) infections are drawing increased interest because of several trends, including the association of NTM infections with the AIDS epidemic and the varied presentations of NTM disease in immunocompetent patients. Nontuberculous mycobacteria cause infections of the lung, skin, soft tissue, bones, and, very rarely, the lymph nodes.[1] We describe here a case of an infected submandibular mass caused by *Mycobacterium fortuitum.* To our knowledge, this is the first case reported in the literature on adult patients that describes resolution of a cervical mass secondary to *M fortuitum* with antibiotics alone.

Case Report

A woman, age 60 years, presented with a one-month history of an enlarging right neck mass. She said that she had had no fever, throat or ear pain, hoarseness, difficulty with swallowing, night sweats, weight loss, or other constitutional symptoms. Her medical history included stage 1 breast cancer, diagnosed a year earlier, for which she had received radiation and chemotherapy. The patient did not smoke or drink alcohol, lived in the Mid-Atlantic Region of the US, and said that she had had no exposure to cats or aquariums. Her physical examination revealed a nontender, fixed 3 × 3 cm nonfluctuant submandibular mass but no other lesions of the head and neck. With a history of penicillin allergy, she was given clarithromycin for presumptive cervical lymphadenitis.

There was no clinical improvement after ten days of antibiotics, at which time a computed tomography scan of the neck demonstrated a well-defined mass lateral to the right submandibular gland, two adjacent subcentimeter nodes, and mucosal thickening of the maxillary sinus. She had normal findings on a complete blood count, blood chemistries, purified protein derivative skin test, chest radiographs, HIV testing, and urine antigen for histoplasmosis. Needle aspirate from the mass showed no acid-fast bacilli, and she had negative findings on bacterial and fungal cultures. Histopathology included caseating granulomas and giant cells. A specialist in infectious diseases advised standard quadruple antituberculous therapy, which was begun. After cultures grew *M fortuitum,* ciprofloxacin was added to the clarithromycin that the patient was already taking. Subsequent in vitro testing confirmed appropriate susceptibilities. Possible open excision of

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the mass was considered, but the mass decreased rapidly to one half its original size in two weeks. After a total duration of three months of antibiotics, the mass resolved completely without surgery.

Discussion

Mycobacterial infections are classified as either tuberculous (*M tuberculosis* and *M bovis*) or atypical/nontuberculous (*M avium intracellulare, M chelonae, M abscessus, M fortuitum, M kansasii, M xenopi,* and others). Nontuberculous mycobacteria are nonmotile and nonspore-forming aerobic bacilli that are ubiquitous in soil, water, unpasteurized milk, and animals.[1–3] Nontuberculous mycobacteria affect immunocompromised and immunocompetent patients alike.[1–4] In pediatric patients, the most common manifestation of NTM infection is cervical adenitis, but in adults 90% of culture-proven mycobacterial cervical infection is due to *M tuberculosis.*[1,5] In the absence of HIV infection in adult patients, cervical lymphadenitis is rarely due to NTM infection.[4] Eighty percent of cases of NTM infection of head and neck lymph nodes are the result of *M avium* complex, and the remaining are the result of *M scrofulaceum, M malmoense,* and *M haemophilum*.[1,3] Isolated case reports have documented *M fortuitum* infections of the submandibular and submental lymph nodes, larynx, pharynx, ears, nasal and oral cavities, and salivary glands.[1–4]

In contrast to tuberculosis, which may present with systemic disease, infections with nontuberculous mycobacteria, including *M fortuitum,* are usually isolated.

Nontuberculous Versus Tuberculous Infection

In contrast to tuberculosis, which may present with systemic disease, infections with nontuberculous mycobacteria, including *M fortuitum,* are usually isolated. There are usually no constitutional symptoms.[4] Unlike tuberculous infection, there is no exposure history to another person in nontuberculous infection because the latter is not transmitted person to person, and findings on chest radiographs in patients with *M fortuitum* infection are almost always normal.[1] The diagnosis of *M fortuitum* infection is confirmed by histopathology and bacteriology. Classic histopathologic changes include microabscesses, noncaseating granulomas, and giant cells.

Therapy

It is critical to distinguish tuberculous from nontuberculous infection because typical mycobacterial infections are treated as systemic diseases with antibiotics, whereas NTM infections are addressed as local infections and almost always require both antibiotics and surgery.[5–11] The distinction has obvious public health implications. A consensus statement issued by the American Thoracic Society states that generally both surgical and antimicrobial therapy are necessary for NTM infection because antimicrobial therapy alone is frequently associated with sinus tract formation, chronic drainage, and recurrence.[1] However, the current guidelines are largely based on anecdotal experiences and have not been subjected to clinical trials. In the pediatric literature, there are isolated case reports of NTM cervical adenitis that was successfully treated with antimicrobials alone (clarithromycin and rifabutin). In these cases, complete surgical excision was not possible or was refused by the patient, and therefore there were no surgical complications.[5,12]

We believe that our patient's excellent clinical response was due to prompt, fortuitous antimicrobial therapy before the occurrence of suppuration or widespread involvement. Allergic to penicillin, the patient was immediately given clarithromycin, the cornerstone of therapy for NTM infection. The optimum duration and choice of antimicrobial therapy for NTM infection is unclear in the literature. Some experts recommend at least three months of antibiotics but suggest that treatment be tailored to each patient's immunologic status, depth of infection, and clinical response.[5] Antimicrobial resistance to tetracyclines and rifampin is reported, whereas clarithromycin appears to be superior in efficacy. An additional agent should be given when there is deeper infection.[5]

The failure of cervical lymphadenopathy to respond to standard antibiotics should alert the clinician to the possibility of mycobacterial infection. Further studies are needed to elucidate the roles of surgical and antimicrobial therapy and the optimum duration of antimicrobial treatment. ❖

Disclosure Statement

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

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Melt The Mass

Genius is present in every age,
but those carrying it within them
remain benumbed unless
extraordinary events occur to
heat up and melt the mass
so that it flows forth.

— Denis Diderot, 1713-1784, French philosopher and author

"Mexican Marionette"

photograph

By Evelyn Zlomke, RN, MPH

Evelyn Zlomke, RN, MPH, is a Perinatal Clinical Nurse Educator at the Vallejo Medical Center in CA. She has a Bachelor of Arts degree in textiles; she makes fabric; she knits; and she paints landscapes in oil. This photograph was taken in 2007. The marionette seems to be climbing into the faux panel of a cabinet door, when in fact nothing is as it appears.

NARRATIVE CASE STUDY

Diagnoses are Stereotypes: Go Where They Are

Dustin L Larson

I found Steve resting up against a window ledge outside a soup kitchen. He was on the periphery of a group of about 30 adults who were milling around outside the kitchen waiting for breakfast. Most of the people were engaged in conversation; a few were involved in playful antics reminiscent of a grade school playground. In retrospect, I think I approached him because he was where I would have been: on the outside, alone, not in the middle of the crowd. I introduced myself as a medical student writing a paper about homelessness and health care and asked if he would be willing to answer a few questions. He didn't say a word and started shuffling down the street, face downcast, hidden deep in the hood of his sweatshirt. I tentatively followed.

A coarse, graying beard and a thin, dirty nose were the only features of his face I could discern as he turned away. I couldn't think of anything remotely intelligent to engage him so I asked if he was cold. He stopped, turned, and looked directly at my eyes, then dubiously replied, "I am sweating out here." His clothes were meager and threadbare and he did not appear to have excess corporeal insulation—wholly inadequate for the temperature and wind chill that morning, in the low 20s Fahrenheit.

I told him that I had a spare coat and asked if he would like it. He shrugged his shoulders and didn't say a word as I handed it to him. He searched out the label, looked at the brand name and size, then indicated that he would keep it. Instead of putting the coat on, he folded it neatly and placed it in a basket lashed to his shopping cart, saying that it had been more than a month since he last took a shower and that he wanted to wait to wear the coat until he could get himself cleaned up.

As we made slow progress through the food line, he described himself as a good student who enjoyed school, particularly art classes, and did well academically. Other than fishing, he said that his sports endeavors and hobbies were few. Following high school and in the footsteps of his older brother, he enlisted in the Navy during the Vietnam era. He escaped being sent overseas and his seventeen-month military service ended where it began in California.

Steve returned to Portland and worked skilled-labor odd jobs in manufacturing, sheet metal, electrical, HVAC, and news print industries. At some point during those years he dated and lived with a girl for about six years. He said that things went bad between them and it was very difficult for him. They did not have children and he never married.

The dining room was warm, but raucous with many discordant conversations, wafts of pungent odors, and the noise of a busy kitchen. Steve spoke quietly and succinctly. He made no attempt to compete with the clamor in the room and our conversation became a real test of my hearing acuity and, more importantly, my ability to simply listen. Above the cashier's station was a white board sign with a handwritten menu and prices. The most expensive plate was $1.25. I realized few in this dining room could easily pay $1.25 for a meal. I was immediately troubled and ashamed by the fact that I had spent an entire morning disgruntled about paying a $2.75 parking fee.

Initially, Steve declined my offer to buy breakfast. He had meal tickets that could be redeemed for a plate of food and cup of coffee at the kitchen. He did not say how he earned or received the coupons, but he said that assistance in the currency of dollars and cents was of more value to him because money could buy beer and other necessities the meal tickets couldn't. At the register, he allowed me to buy his breakfast and thanked me.

I stood next to him at a bar while he ate his breakfast. He commented that the scrambled eggs were green, but he could tell by the smell that they were real eggs. He salted the eggs and said the taste was just fine. I asked him a few more questions and his responses remained minimal at best. In a vain attempt to establish some credibility and earn his confidence, I showed him the pages from the Principles of Clinical Medicine syllabus that described my assignment. He

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nodded and continued to eat. I felt I had exhausted all my strategies, so I decided to close my mouth and listen. He quietly finished his breakfast and offered a little more of his story.

He explained that in 1986, he had fallen from an apartment building and shattered both feet and broke both ankles and legs. I asked if the circumstances of the fall were work related. He didn't answer. He said that his experience with poverty and homelessness began in the aftermath of that accident. His recovery from those injuries was slow and incomplete and prevented him from returning to work full time.

"I am a loner. I take care of myself. I don't really have any other friends."

He thanked me again for breakfast, cleaned up his place setting, and headed for the door. In the comfortable warmth of the kitchen, sensation had finally returned to my face and hands and I despaired continuing our conversation outside. On my way out the door, I walked past a long line of people still waiting for breakfast and realized that Steve was unselfishly giving up his seat for them, many of whom he said he recognized, but none that he considered his friends. He told me that he is not involved with much of anything that resembles a community. He said that even though he still has family in the area, he has little contact with them. He said, "I am a loner. I take care of myself. I don't really have any other friends."

When I caught up with Steve outside, he was making some adjustments to things in his shopping cart. He said that all of his personal belongings were in the cart. There is no free place to safely store his things. He can't leave his cart and doesn't trust anyone to watch it for him because he has been robbed so many times. He had a bedroll that was neatly wrapped in a garbage bag and a small, plastic shoebox-sized bin that looked like it contained a random assortment of tools, odds and ends, and personal effects. There was a cardboard box on the bottom of the cart with a few pieces of clothing in it; he had a plastic container and several large sturdy shopping bags securely tied to the sides of the cart in which he stored bottles and cans for recycling. Steve said this is his only consistent source of income. In recent years, competition for recyclables has increased to a point that he walks about five miles per day to earn a few dollars. He does not receive public assistance, worker's compensation, or veteran's benefits. He indicated that he knows about those programs, but he seemed uninterested in accessing them.

Steve opened an old dented and rusty metal tin and pulled out a cigarette butt, lit it with a match, took a couple puffs, then set out on his "route." I didn't ask if I could join him, but he seemed unperturbed by my presence. His gait was stiff and appeared painful. He frequently stopped to scratch the back of his legs and his scalp. He told me that he had scabies—the reason he won't stay in missions: "people in the missions have bugs and the quarters are close so the bugs get around." He sleeps on the street most of the time. He said he put off getting treated for the scabies too long and the infestation was really bothering him. His shopping cart is not allowed on public transit, thus he can only get treatment at clinics or hospitals he can walk to. Three days earlier, he made it to a hospital and received a large tube of permethrin with little result so far.

When I asked him about access to health care resources he was familiar with names of free and low-cost clinics, but didn't indicate that he uses them. He sounded like he had been pretty healthy and free from significant medical or surgical history. His family history was interesting only because of a stroke on the maternal side. He had never been diagnosed with health problems such as high blood pressure or diabetes. His last visit to a physician was about one year earlier at the Veterans Administration (VA) when he tried to get set up with primary care. He said that inability to safely store his belongings and transportation were the only factors that prevented him from establishing that relationship and follow-up through the VA health system.

Other than his current skin infestation, his only specific health complaint was that his feet often felt like they were burning and his legs hurt while he was walking. He said the most effective and available treatments for his foot and leg pain were his attitude and alcohol. He described the pain as "real pain" that medications like vicodin provide some relief from, but he attributed his ability to cope without narcotics to self-determination and will. He was unequivocal about his alcohol consumption and said that it also helped with the pain. He said he began drinking and smoking as a kid and has ever since. Whether by personal choice or otherwise committed, he described several stints at a detox facility and said they don't give a person enough time to dry out. He said he gets picked up by the police two to four times per year for violation of open container laws. His sentences usually involve eight-hour service-oriented activities in the community, which he enjoys.

He stopped frequently to pick up the used ends of cigarettes on the ground and in ashtrays, especially abundant outside nightclubs and construction sites. It broke my heart to watch him park his loaded-down

shopping cart on the sidewalk and stoop down to pick up that precious treasure of his when it was nothing more than garbage thoughtlessly tossed away by others. My instincts were telling me to encourage him to quit, but I found myself picking up "good ones" for him. After we collected a good number he stopped for a rest and to roll a cigarette. His numb hands painstakingly broke traces of tobacco leaves out of the expired stubs and carefully lined it up on a delicate white piece of smoking paper. Minutes into his laborious effort a vicious gust of wind tore the paper from his cold hands and left him unrequited. He cursed quietly, stood up, and continued on his way. He asked why I wasn't wearing a hat and started to offer me one of his. It was the second time that day I was struck with his care, concern, and generosity toward others in spite of his situation and meager means.

As we slowly made our way around town he told me that he hasn't had any bad experiences with physicians or the health care system. He said that physicians have treated him professionally and that he has had no negative experiences associated with stereotyping or prejudice in health care. He did describe occasional instances of less than humane treatment in restaurants and businesses that he attributed to the condition of his clothes and appearance. There is a facility downtown where he washes his clothes every six weeks and it seems his access to a shower is with similar frequency. He lives in one set of clothes unless he is fortunate enough to pick up something new through a shelter or mission.

I asked him if he could recall a fond memory from his childhood or any other time in his life. He almost seemed confused by the question so I asked if he had any pleasant recollection of cherished moments with family, friends, or travels and hobbies; he never answered the question. A few minutes later, I was helping him dive a dumpster behind a bar for beer bottles to recycle and I realized that concepts like joy and happiness might seem foreign or be purposefully stifled by someone in Steve's situation. Without a smile, but with an unmistakable gleam in his blue eyes he said, "We've hit a load here, I'm gonna need a box." He explained the dangers of sifting through garbage to me and complained that the noise from the glass bottles might bother people and bring untoward consequences. He abruptly stopped picking out bottles even though there were others left within easy reach saying, "I'm not greedy, just thirsty."

Our destination was a service station that would give him credit for his recyclable bottles and that stocked his preference for beer. He remarked about the education I was getting by following along with him observing how the other side lives. I agreed that I was learning a lot from him and enjoying the experience as well. Progress up the hill was still slow but there was pep in his stride that I hadn't observed to that point. At a steep side-sloping sidewalk I reached out to steady his faltering shopping cart and he warned me to be careful because the cart was heavy and unpredictable. He said he could handle it and then skillfully maneuvered the cart up to the front door of the station. He carefully sorted out the bottles he knew they would accept and with unassuming confidence strode in the doors to make his transaction.

Reflection

As a student at Oregon Health and Science University, I have had the opportunity to take the Principles of Clinical Medicine (PCM) course, which seeks to provide medical students a patient-centered care context early in their training. This course is a two-year longitudinal course consisting of two components: a classroom experience and a weekly preceptorship in which students spend four hours per week with a community physician.

In my efforts to fulfill the requirements of the PCM course, I found myself considering people on the basis of casual observation of their living situations, physical characteristics, and behaviors—judging using stereotypes. I realize diagnoses are stereotypes.

The first step in the physician-patient interaction is to recognize general patterns in the presenting clinical picture and diagnostic workup. The need to ask difficult questions of patients is a reality with potentially severe consequences. What if I refrain from asking a seemingly innocuous question because I am overly conscious of the possibility of being misunderstood? The information gained from inquiring about sensitive issues or high-risk behaviors is invaluable and applies in almost any clinical setting or patient encounter because it has so many implications for the health and treatment of the patient. If the patient does not volunteer information about risky behaviors or lifestyle, the physician must be prepared to address those topics either as a matter of routine or on the basis of observation of the patient's clinical presentation. Misapplied, stereotyping and discrimination will bring harm to the patient and to the physician but I believe the physician's effectiveness will

It was the second time that day I was struck with his care, concern, and generosity toward others in spite of his situation and meager means.

be marginalized without the skills of keen observation and the ability to extrapolate from observation.

The PCM curriculum describes a culturally competent physician as one who recognizes cultural beliefs and practices and uses that knowledge to promote the health of their patients.[1] A variety of influences and experiences as a medical student have increased my level of self-awareness with regard to my own worldview and attitudes and enriched my recognition of different cultural worldviews and practices.

Estimates indicate that as many as 842,000 people experience homelessness on a given day nationally or 3.5 million annually in 2007.[2] The annual public cost of the chronically homeless, who comprise a relatively small proportion of the homeless population at about 150,000 is estimated at $10.95 billion.[3]

Susan Montauk, MD, of the University of Cincinnati College of Medicine, describes the following ten guidelines to consider in clinical decision making when caring for homeless patients: overcoming barriers to care, building trust, diet, access, nomadic lifestyle, medications, patient education, children and adolescents, ancillary care, and physician education.[4] The guidelines are straightforward, patient centered, and immediately practicable by any physician.

My appreciation for the influence of the determinants of culture on how patients experience health care is developing. I am a work in progress and practical recommendations and tools like Dr Montauk's contribute significantly to that process. I propose to become a physician with the medical knowledge and technical ability to treat the body. I desire to be perceptive of the unmet emotional or social needs of individuals, perhaps like Steve, for whom I will be privileged to care. I will respond to them with a compassionate heart and I look forward to learning how to approach them with confidence, knowledge, and whatever resources are available to help meet their needs. ❖

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Putting The Parts Back Together Again

[The physician] will use scientific methods, he will for a time dismember his patient—isolate, for instance, his kidneys or his heart and observe their action under very specialized conditions—but in the end he has to put these parts together again in his "diagnosis" … his total conception of the relationships between the patient as a person, the disease as a part of the patient, and the patient as a part of the world in which he lives.

— Thomas Addis, MD, 1881-1949, physician and pioneer in the field of nephrology

Image Diagnosis: Pulmonary Embolism

Gus M Garmel, MD, FACEP, FAAEM

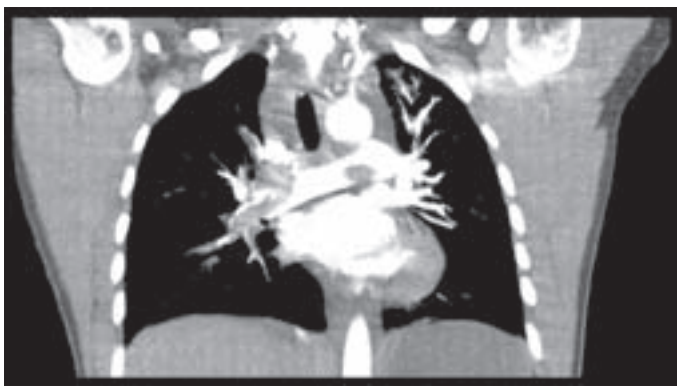

Figure 1. Axial view from a computed tomography (CT) angiogram which beautifully demonstrates a large saddle pulmonary embolus in a previously healthy female age 33 years who presented to the Emergency Department following a syncopal episode. She was not pregnant, and had mild chest pain, dyspnea, tachycardia, and tachypnea, which were not present before her episode.

Figure 2. (same patient) CT angiogram demonstrating a large branching clot consistent with a pulmonary embolism.

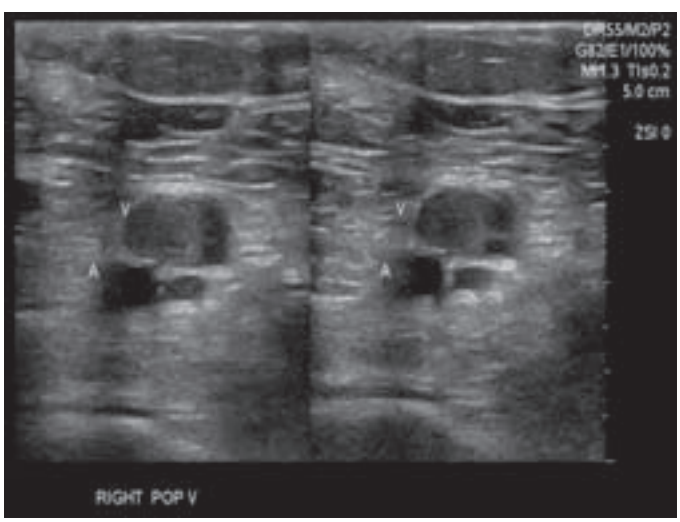

Figure 3. Compression ultrasound demonstrates a patent popliteal artery (A) in both images. A clot can be seen in the popliteal vein (V), which does not collapse during compression (right-sided image).

Acknowledgments

Dr Garmel would like to thank Bruce Wollman, MD; John Rego, MD; and Diane Craig, MD, for their assistance selecting the most illustrative images for this interesting case, as well as for their participation in the care of this challenging patient.

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Image Diagnosis: Radial Head Fracture

Gus M Garmel, MD, FACEP, FAAEM

The patient presented to the urgent care clinic after trauma to the upper extremity.

Figure 1. Lateral view of an elbow, in which you can easily see a posterior fat pad (never normal) and an anterior "sail sign." Together, these represent a relatively large hemarthrosis around the elbow joint, suggestive of a fracture. On close inspection, a cortical disruption and small depression of the radial head is apparent. There is also slight elevation of the supinator line due to the hemarthrosis present, although this finding is much more subtle and less specific.

Image Diagnosis: Abdominal Aortic Aneurysm

Gus M Garmel, MD, FACEP, FAAEM

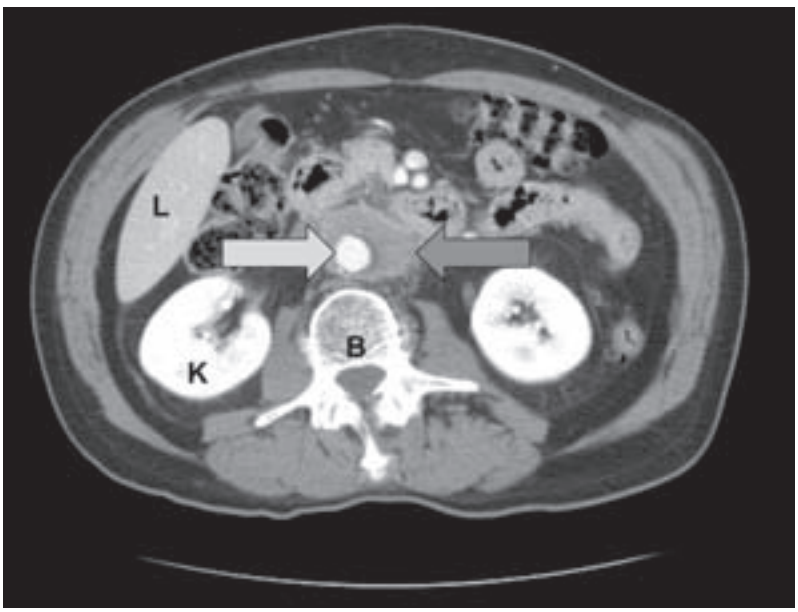

Figure 1. Abdominal computed tomography (CT) scan with IV contrast demonstrates a leaking abdominal aortic aneurysm (AAA). The light arrow points to contrast within the lumen of the abdominal aorta. The dark arrow points to the outer walls of the abdominal aorta. At the level of the kidneys, the abdominal aorta is always found directly on top of the spine.

K = kidney, B = spine (vertebral body), L = liver

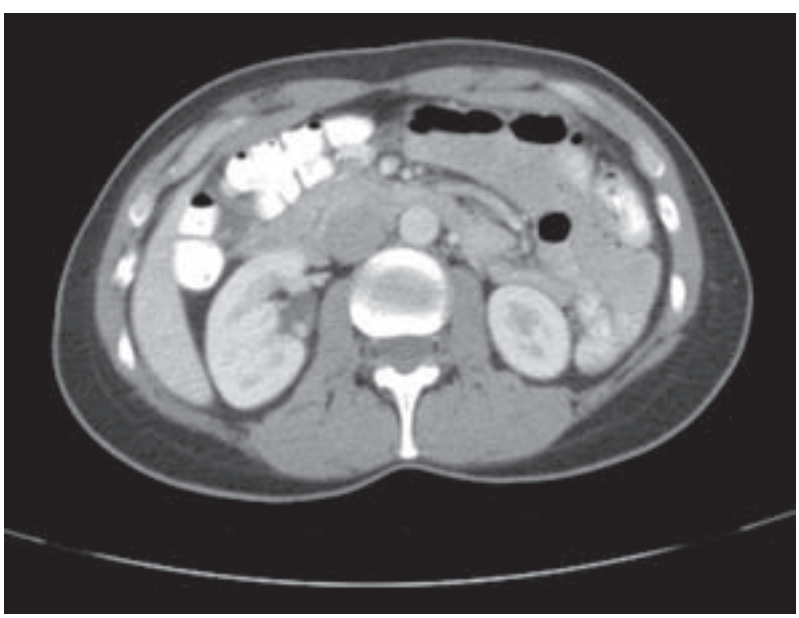

Figure 2. Normal abdominal CT scan.

CME available online: www.kp.org/permanentejournal

COMMENTARY

The Changing Face of HIV Infection

William J Towner, MD, FACP

Introduction

Since the first report, in 1981, of AIDS in five men who have sex with men (MSM) in Los Angeles,[1] the AIDS epidemic has swept the world. In the US, during the intervening 27 years, the demographics of the disease have changed dramatically. What was once a disease of Caucasian MSM has evolved into a disease that increasingly affects women and disproportionately affects people of color.[2] This brief review will examine the demographics of the HIV epidemic as it now exists in the US.

Tracking the Epidemic

The Centers for Disease Control and Prevention (CDC) has assumed a pivotal role in tracking the spread of the AIDS epidemic. During the early years of the epidemic, the CDC tracked only AIDS cases, defined as: T-cell count less than 200 or development of AIDS-defining opportunistic infections. Given the poor response to HIV therapy in those early years, this method enabled the CDC to estimate with greater accuracy the numbers of people who were infected with HIV because the disease often progressed in a predictable pattern. Beginning in the mid-1990s, however, the era of highly active antiretroviral therapy (HAART) was ushered in with the advent of the protease inhibitors. For the first time, it became possible to control effectively viral replication and forestall the progression of HIV-infested patients to fulminate AIDS.[3] As a result, simply tracking the new cases of AIDS was no longer a reliable way to track the spread of HIV. In recent years, nearly every state has adopted names-based HIV reporting as the most accurate method of tracking the disease. For the purposes of this review, data

"The World of AIDS" photo by Chris Jacobs.

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for AIDS cases will be reviewed for all 50 states, although HIV data will be presented only for the 33 states that had names-based HIV reporting as of 2006.

AIDS Cases and Death

Figure 1 illustrates the estimated number of AIDS cases and deaths in the US from 1985 through 2006.[2] Although it appears that a "peak" occurred in 1993, this was in fact because of the expansion of the CDC's case definition of AIDS in 1993. With the introduction of HAART in 1996, many in the field expected a continued decline in the AIDS cases seen. Instead, a leveling of the number of AIDS cases was seen in the period 1999-2006.

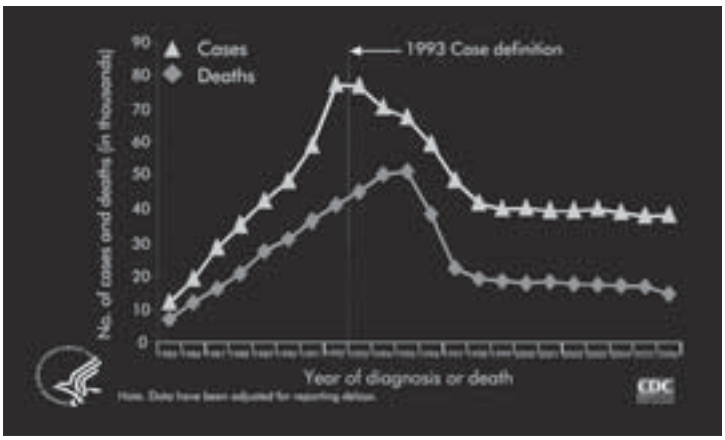


Figure 1. Estimated number of AIDS cases and deaths among adults and adolescents with AIDS, 1985-2006—US and dependent areas.[2]

Reprinted from: Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. Cases of HIV infection and AIDS in the US and Dependent Areas, 2005 [monograph on the Internet]. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention; 2005, Rev 2007 Jun Vol 17 [cited 2008 Apr 17]. Available from: www.cdc.gov/hiv/topics/surveillance/resources/reports/2005report/default.htm.

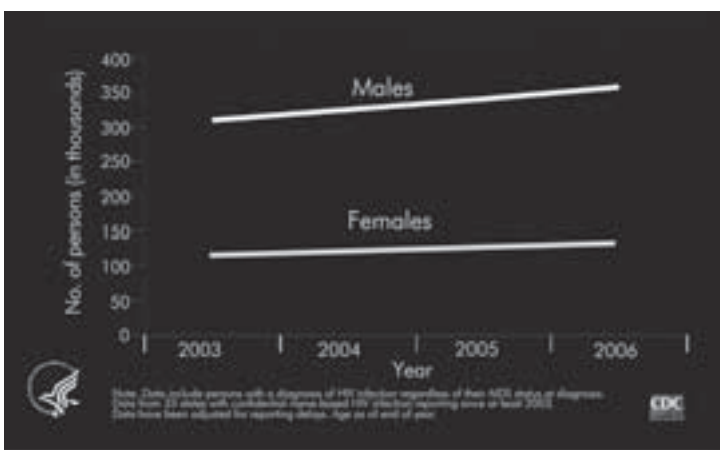


Figure 2. Estimated number of adults and adolescents living with HIV/AIDS, by sex, 2001-2006—33 states.[2]

Reprinted from: Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. Cases of HIV infection and AIDS in the US and Dependent Areas, 2005 [monograph on the Internet]. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention; 2005, Rev 2007 Jun Vol 17 [cited 2008 Apr 17]. Available from: www.cdc.gov/hiv/topics/surveillance/resources/reports/2005report/default.htm.

Increasing Men-Who-Have-Sex-With-Men Rate

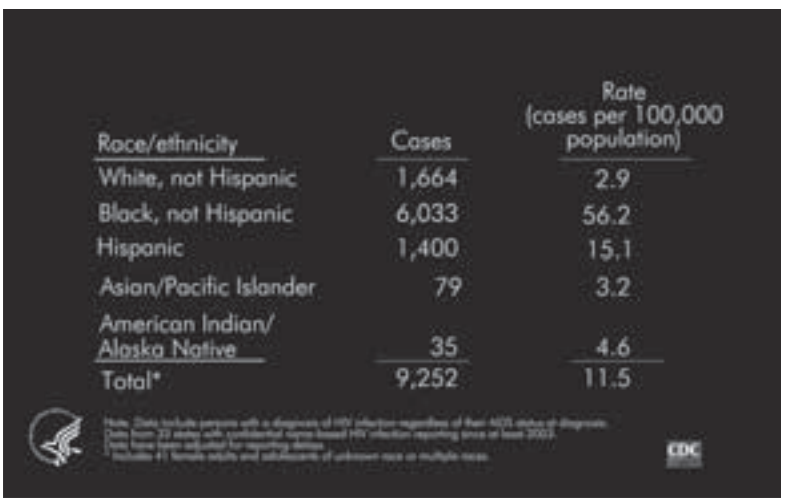
Turning more specifically to look at data regarding HIV infection, a gradual increase in cases has been seen consistently since 2001 (Figure 2).[2] Whereas heterosexual contact cases have been stable, cases attributed to male-male contact have been on the rise consistently since 1999. In fact, the jump in male-male cases from 2004 to 2006 was among the largest jumps seen, from 16,167 cases to 18,296 cases, a 13% increase. The proportion of HIV/AIDS cases attributed to male-to-male sexual contact increased from 45% in 2003 to 50% in 2006. HIV/AIDS cases attributed to injection drug use, high-risk heterosexual contact, and male-to-male sexual contact and injection drug use remained stable from 2003 through 2006.[2] These numbers are corroborated by data that also shows the rate of syphilis rising among MSM during the same time frame,[4] and with data from survey-based studies reporting on the sexual habits of men.[5]

Potential explanations for the rising rate in MSM could include complacency among MSM due to the now "chronic disease" nature of HIV, which HAART has enabled,[6] substance abuse (particularly methamphetamines), and awareness of HIV-infection status. Indeed, one study found that, adjusted for covariates, there was a hazard ratio of 1.46 (Confidence interval 1.12-1.92) for methamphetamine use and HIV

Race/ethnicity	Cases	Rate (cases per 100,000 population)
White, not Hispanic	9,078	16.7
Black, not Hispanic	11,230	119.1
Hispanic	5,058	50.9
Asian/Pacific Islander	318	13.5
American Indian/ Alaska Native	129	17.7
Total*	25,928	33.8

Figure 3. Estimated number of HIV/AIDS cases and rates for male adults and adolescents, by race/ethnicity 2006—33 states

Reprinted from: Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. Cases of HIV infection and AIDS in the US and Dependent Areas, 2005 [monograph on the Internet]. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention; 2005, Rev 2007 Jun Vol 17 [cited 2008 Apr 17]. Available from: www.cdc.gov/hiv/topics/surveillance/resources/reports/2005report/default.htm.



Race/ethnicity	Cases	Rate (cases per 100,000 population)
White, not Hispanic	1,664	2.9
Black, not Hispanic	6,033	56.2
Hispanic	1,400	15.1
Asian/Pacific Islander	79	3.2
American Indian/ Alaska Native	35	4.6
Total*	9,252	11.5

Figure 4. Estimated number of HIV/AIDS cases and rates of female adults and adolescents, by race/ethnicity 2006—33 states

Reprinted from: Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. Cases of HIV infection and AIDS in the US and Dependent Areas, 2005 [monograph on the Internet]. Atlanta (GA): US Department of Health and Human Services, Centers for Disease Control and Prevention; 2005, Rev 2007 Jun Vol 17 [cited 2008 Apr 17]. Available from: www.cdc.gov/hiv/topics/surveillance/resources/reports/2005report/default.htm.

seroconversion.[7] The high rate of HIV-infected individuals who do not know their serostatus was the impetus, in 2006, for the CDC to call for universal screening for HIV in the US.[8] Whatever the cause, the rise in HIV cases among MSM has concerned public health authorities and HIV activists.

People of Color

Another statistic that has long caused concern is the disproportionate rate of HIV infection among people of color. As seen in Figure 3, the prevalence rate of infection of African-American males in the US is nearly *seven times* the rate of Caucasians, whereas the infection rate in Hispanics is more than twice the rate of non-Hispanic white males.[2]

In females, the racial disparity is even more striking, with African-American women having a prevalence rate that is *20 times* that of non-Hispanic whites (Figure 4).[2] Many hypotheses have been introduced to explain this racial disparity, among them socioeconomic factors and sexual network patterns among African Americans.[9]

Gender

Among women in the US, the absolute number of AIDS cases has stayed relatively consistent from 1998-2006. However, when looking at all cases of HIV in the US, the proportion of female adults and adolescents (age >13 years) with an AIDS diagnosis increased from 7% in 1985 to 27% in 2006.[2]

Among females diagnosed with HIV/AIDS in 2006, 80% of HIV/AIDS cases were attributed to high-risk heterosexual contact, 19% to injection drug use and 1% to other or unidentified risk factors.[2]

Looking at a longer time frame, from 2001 through 2006, an estimated 48,936 AIDS cases that were diagnosed among female adults and adolescents were attributed to either injection drug use or high-risk heterosexual contact. High-risk heterosexual contact accounted for the majority of AIDS cases among females, particularly in the southern states.[2] Many of these women live in poverty in rural settings and are not aware of the primary risk behaviors of their male sexual contacts.[10] However, the high rate of heterosexual transmission should alert all primary practitioners who care for female patients in the US to obtain a careful sexual history.

Age

Another interesting phenomenon occurring in the HIV epidemic is the gradual aging of the cohort in the US. The CDC has estimated that the number of AIDS cases among patients age 50 years or older increased more than five times between the years 1990 through 2000.[11] Before the era of HAART, older age predicted a faster progression to clinical AIDS and death.[12] Although data from randomized-controlled trials in this area are lacking, a large retrospective study by the Kaiser Permanente Division of Research recently published showed that older-age patients beginning HAART actually had better virologic responses than younger patients and, despite blunted initial immunologic responses, had similar CD4 T-cell counts after three years of therapy. Higher HAART adherence was advanced as a possible explanation for the improved virologic responses seen in the older group.[13] From a long-term perspective, as the HIV population ages, they will be subject to many of the same diseases as the noninfected population. How HIV and HAART will interact with such common diseases such as diabetes, hypertension, and renal insufficiency remains to be seen.

Another area of much concern is the rising rate of AIDS diagnoses in the young adult (ages 20-24 years) population. There has been a steady rise in cases among this age demographic, especially in males.[2] Complacency about the disease, substance abuse, and a reduction in person to person communication about HIV may be driving some of this increase.[14]

Summary

In the more than 20 years since the first case of HIV, the demographics of the disease in the US have changed significantly. Although the mortality rate for HIV has plummeted during the last ten years, the disease remains an important cause of morbidity and mortality. The rate of MSM infection continues to rise and there continues to be marked disparities in the rate of infection by race. As the HIV-infected cohort ages, researchers will continue to explore how HIV interacts with other common conditions seen in the elderly.

After 27 years of the HIV epidemic, it appears that HIV will continue to be a health issue for many years to come. Thus, physicians and clinicians must remain as vigilant as ever for HIV in their practices. Preconceptions about age, gender, ethnicity, or sexual orientation should not deter clinicians from screening for HIV. ❖

Disclosure Statement

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"Not Forgotten" photo by Chris Jacobs.

Chris Jacobs is a freelance photographer in Atlanta, GA and a graduate of The Center for Digital Imaging Arts at Boston University in MA. This photograph was taken at the Confederate Cemetery in Marietta, GA. The idea of a soldier whose actions are remembered while his person is forgotten was the inspiration for this photograph.

COMMENTARY

Information Technology Innovation

Yan Chow, MD, MBA, FAAP

"Innovation is what distinguishes between a leader and a follower" is a statement often attributed to Apple cofounder Steve Jobs. Nowhere is this saying truer than in the realm of information technology (IT), where the blistering pace of change can make even casual observers dizzy. Yet IT innovation can be a two-edged sword. It can empower a health care organization to leapfrog its competitors and delight its customers, or it can weigh on that organization like a millstone around the neck.

How does one reconcile the rapid emergence of technologies with the slower, more deliberate response time of a large organization? One answer is to ignore disruptive technologies, letting nimbler competitors exploit them first. That is a good way to get blindsided or left behind.

Perhaps a better answer is to identify, investigate, and understand new technologies much earlier in their life cycle—months to years before they hit the mainstream—so that organizations have time to get ready. This has been the task of a new group within Kaiser Permanente (KP) Information Technology (KP-IT): the Innovation & Advanced Technology Group (IAT). Only two years old, IAT is a forward-looking group of clinicians, engineers, and business analysts that identifies and investigates the clinical information technologies that are likely to hit the mainstream in the next two to five years. The goal is to develop realistic, objective, and informed recommendations for KP leadership and stakeholders that reduce the risk inherent in new technologies.

IAT is affiliated with KP's Sidney R Garfield Center for Health Care Innovation, a 37,000-square foot care delivery simulation laboratory located in San Leandro, CA, sponsored by KP-IT, National Facilities Services, and Patient Care Services. Within this facility is a full-sized medical-surgical ward from KP's template hospital, critical care and special needs patient rooms, operating room, labor and delivery suite, Emergency Department patient room, ambulatory clinic, home care environment, IT lab, and conference space, as well as a test version of KP's electronic medical record. This unique resource allows KP to analyze technologies, care delivery workflows, furniture, and facility designs in a mock environment that is as close to live as possible without the disruption in patient care that live testing would cause.

Unlike most other health care organizations, KP now has a structure and resources in place to investigate technology vendor claims, markets, and trends independently and without bias. This is very much in the spirit of KP's approach to pharmaceuticals and gives KP an unquestionable edge in managing a growing health care IT portfolio.

Hype to Reality

The first benefit of such a proactive approach is organizational wisdom. Using objective analysis similar to how best practices are defined in medicine, we sift through the hype to discover the truth. IAT develops an accurate picture of benefits, costs, and risks not only

Care delivery simulation laboratory at the Sidney R Garfield Center for Health Care Innovation.
Source: Kaiser Permanente Sidney R Garfield Center for Health Care Innovation

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in the contexts of technology, vendor, industry, market, and time horizon, but in the more specialized contexts of health care and KP.

Unlike pharmaceuticals, IAT's analysis factors in not just clinical trials and industry studies, but also the important impact of technology on our patients, from ease of use, convenience, and care personalization to seamless care environment transition to emerging trends in consumer technology.[1] Though not strictly clinical, these factors significantly affect the consumer experience and can create meaningful differentiation between competing health plans in an extremely tight market.

Innovations are typically built upon prior innovations.

Ear to the Ground

Organizational preparedness is a second benefit of this *future sensing* activity. In some cases, it is better to wait for technologies, vendors, and industries to mature; in other cases, waiting too long results in unnecessarily expensive and wasteful remediation. The future is never entirely predictable, but as we keep our ears to the ground, what we hear may tell us how far away it is and how fast it's approaching.[2] Wrong turns and detours will occur, but successful organizations correct course quickly and look forward rather than backward.

Competency and Capability

Next is organizational competence. Skillful nurturance and management of innovation—itself a sign of innovation in a large company—is a competitive advantage that will grow as IT's footprint grows and IT matures as a strategic lever in health care. This is a journey we are just beginning to take as an organization.

Core competencies are the production skills an organization develops over time. A sustainable competitive advantage occurs when a group of competencies are integrated with each other into a *capability,* a broader-based strategic expertise that aligns the value chain to make an organization more effective. A new organizational capability takes time to develop—years or even decades—whether it is the organization or its competitors who are pursuing it.

Over time KP will develop a core expertise—a capability—in how to best manage clinical IT innovation given KP's strengths, weaknesses, traditions, processes, and complexities. Such expertise can only come from blending the insights of our engineers, clinicians, and business managers with the best insights of outside analysts and academicians. Not only will KP's decisions be better informed, but KP will avoid the opportunity costs of not fully leveraging its IT investments or failing to recognize when an investment has outlived its usefulness.

This will clearly take time and serious collaboration given the number of silos and agendas in a large organization. Nevertheless, if KP stays the course and visionary leadership continues, such a capability will become a valuable strategic asset that is rare among health care organizations.

Focused Creativity

Organizational creativity is yet another benefit. Innovations are typically built upon prior innovations. It takes an open and creative mind to look at an array of diverse old and new technologies and determine value through adoption, synergy, repurposing, or scope change. The distinction between the "not invented here"[a] syndrome and outsourcing quickly becomes artificial. Such intentional creativity is shaped by technology, processes, resources, capabilities, business priorities, and culture and could be termed *focused creativity* because the operational objective is topmost in mind.

The Ultimate Goal

Last but not least, superior organizational performance is the ultimate mark of successful IT innovation. In the short term, it may be reflected in improved quality of care, service, cost savings, revenues, or member and professional satisfaction. However, the real litmus test for an organization that claims to be innovative is its willingness to invest further into the future in order to reap advantages that are more strategic in nature—advantages that have the power to change the game itself.

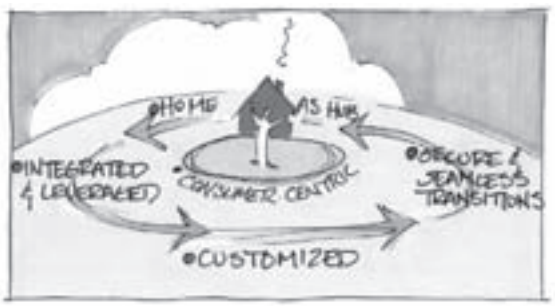
Long-term thinking has not been a traditional strength in health care, but is quickly becoming a top priority as health care organizations recognize the mounting investment they must make in IT to meet strategic business objectives. A 2007 survey of Chief Information Officers found an increasing percentage (79.6%) who felt their roles had become more strategic compared to previous years.[3]

High-Priority Technologies

With KP's strategic needs in mind, IAT has focused primarily on the following areas in 2008:

- Telehealth: health care beyond the walls of our facilities
- Mobility and wireless: the delivery of health care over mobile devices

- Time and cost savings: use of communication systems to increase efficiency
- Chronic care management: caring for resource-intensive patients
- New forms of care: genomics, robotics, and other disruptive technologies.



Kaiser Permanente Blue Sky Vision of home as the hub of care.

Source: Kaiser Permanente Blue Sky Vision

Telehealth

Telehealth is the delivery of health care to Health Plan members at a distance. Communication technologies and physiologic monitoring devices are used to extend care and communicate with patients who can be appropriately managed with this modality. Vital signs, weight, and even some chemistries can be tracked remotely through wireless devices. Patients connect with their care team using two-way videoconferencing, voice over IP,[b] or other means. The fundamental guiding principle is that health care should be patient-centric and the hub of care should be where the member is, whether at home or elsewhere.

IAT has engaged many disciplines and groups across the program in a substantial yearlong effort to evaluate and make recommendations on telehealth. The outcome includes reviews of external and internal telehealth programs and their results, a telehealth strategy document, and toolkits for specific telehealth programs.

Telehealth is suitable for chronic illnesses. Patients with diabetes can look forward to products like the GlucoPhone, a convenient integrated cell phone-glucometer that replaces the conventional glucometer with real-time remote management of diabetes through 24/7 measurement and transmission of glucose levels.

Health Hero Network's Health Buddy is one example of a home-monitoring system that asks personalized questions of a patient through a simple interface, takes in vital signs or weight data from other home devices, and relays this information to the clinical team as part of a two-way communication process.

Motiva from Philips is a TV-based remote patient monitoring system that also provides patient education content for a number of chronic diseases. This system and others like it can be programmed to deliver KP-specific educational activities and recommendations to patients in the home setting.

TV-based remote patient monitoring system.

Source: Philips

Mobility and Wireless

Mobility and wireless is an area of focus that recognizes the recent global explosion in the use of mobile devices. These include cell phones, smart phones, ultraportable notebooks and tablets, and handheld entertainment/gaming systems in which features and applications like context-aware user interfaces, voice and text communications, biometric authentication, location tracking, and other capabilities are converging.

Patient indoor positioning system.

Source: Sonitor Technologies

Radianse and Sonitor are two companies offering an indoor positioning system, also known as a real-time locating system. They use radio frequency identification and ultrasound tags and sensors, respectively, to

track biomedical equipment, staff, and patients as they change locations in real time, making it possible to track equipment, reduce wait times, optimize workflows, and flag security violations.

Time and Cost Savings

Another area of opportunity is time and cost savings based on communication technologies. Some examples are physician social networking, real-time intelligent patient scheduling, and self-service kiosks located in hospital and clinic settings. A time-saving self-registration kiosk has been well received by patients in the Southern California Region, generating broad interest in further pilot studies.

Chronic Care Management

Chronic care management is a top priority for most health care organizations due to the disproportionate resources consumed by patients with chronic illnesses. One approach is to deliver care in less intensive settings like the home wherever possible. Thus many of the technologies in this area overlap with those in telehealth. Glucoband is a wristband device from Calisto Medical that continuously and noninvasively measures glucose levels using a proprietary technology called bio-electric impedance spectroscopy. It also meets Food and Drug Administration (FDA) standards for sampling accuracy.

(Above) 1-lead ECG rhythm strip transmitter in the form of a wallet.

Source: CardioPocket Available from: www.shl-telemedicine.com.

(Right) Hospital courier robot.

Source: Kaiser Permanente photo

Real-time virtual training scenario.

Source: Forterra Systems, Inc

CardioPocket is a 1-lead ECG rhythm strip transmitter in the form of a wallet that tracks cardiac rhythm disturbances while eliminating the need for a bulky, intrusive conventional monitor. The wallet is connected to a cell or regular phone and placed against the chest. Within seconds a real-time ECG strip is sent to a remote monitoring station.

New Forms of Care

New forms of care include digital pathology, genomics, robotics, virtual world technology, brain fitness, and many other technologies that are forging new fields of innovation. The Aethon Tug is a hospital courier robot that can pull standard hospital carts from station to station following a digital map, automating the delivery of linens, meals, medications, and lab samples. Tug augurs the growing presence of assistive robots in health care and society.

Forterra and Second Life are two companies that provide online reality simulations. As part of a successful pilot, KP Patient Care Services partnered with Forterra in 2007 to build a virtual replica of a KP hospital ward online. The result was a powerful and cost-effective tool for live collaborative nursing education. Nurses assumed avatars—symbolic representations of themselves—as they worked with other clinical staff in immersive real-time training scenarios.

On the basis of current theories about brain plasticity, PositScience software targets dementia and promotes brain fitness through specially designed interactive games. The company is the first to apply for FDA certification of a brain fitness product as therapeutically effective.

Operating Room of the Future

Another major IAT initiative is KP's Operating Room of the Future (ORF), a collaboration between KP-IT, National Facilities Services, and Clinical Technology to assess future technology needs of ORs by taking a broad view of systems and infrastructure, defining device interoperability, supporting new workflows, identifying issues, and creating a new facility template.

Located at the Garfield Center, ORF will produce greater efficiency in perioperative services, better regulatory compliance, improved quality and patient safety, lower medical-legal liability, greater professional and patient satisfaction, and purchasing decisions that support technology integration and planned infrastructure.

Creating a Culture of Innovation

Other key initiatives include the new KP-IT Innovation Fund to foster internal innovation, and KP's first user-oriented software development environment, which will support Innovation Fund projects as well as other IT projects. Both are generating organization-wide interest as they round out KP's approach to IT innovation.

What tidal waves of change will wash over KP in the next decade? Rupert Murdoch is purported to have said, "The world is changing very fast. Big will not beat small anymore. It will be the fast beating the slow." As technology refresh rates accelerate and hype cycles shorten, a world-class capability in managing health care IT innovation will become mission-critical in order to sustain the organization's competitive advantage and open green-field opportunities for pioneering leadership. For our patients, IT innovation will create attractive and affordable new ways to access high-quality health care, to stay in touch, and to stay healthy. ❖

[a] "Not invented here" (NIH) is a term for a culture that shuns existing external products in favor or reinventing the same product internally; normally used pejoratively. See: http://en.wikipedia.org/wiki/Not_Invented_Here.

[b] Voice over IP, an Internet-enabled voice communication technology

Disclosure Statement

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

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To get more information on IAT or to download technology reports and white papers: http://kpnet.kp.org/iat/

To find out more about the Garfield Center: www.kp.org/innovationcenter/

To contact IAT about job/work opportunities or other matters: iat@kp.org

Kaiser Permanente Operating Room of the Future.

Source: Kaiser Permanente photo

Invent It

The best way to predict the future is to invent it.

— Alan Kay, b 1940, American computer scientist

EDITORIAL STUDY

Relationship of a Physician's Well-Being to Interactions with Patients: Practices of the Highest Performing Physicians on the *Art of Medicine* Patient Survey

Tom Janisse, MD

Introduction

What do physicians do to most satisfy their patients? And how do they maintain a state of well-being in their clinical practice? The answers to these questions have unfolded in a series of studies over seven years.

Recent Studies

Pilot Study

In 2001, a pilot study was conducted in Portland, OR to explore the communication practices of physicians who scored highest on the Art of Medicine (AOM) Patient Survey (see Sidebar: Art of Medicine Attributes), five years post implementation. The 2002 published report cited five core practices that emerged from 21 top-performing physicians: courtesy and regard, attention, listening, presence, and caring.[1]

Garfield Study

This communication research continued in 2004 as part of two-region Garfield Memorial Fund research: MD-Patient Communication Study, part of the Clinician-Patient Communication Research Initiative.[2] Researchers have consistently found the top predictors of overall patient satisfaction are the quality of the physician-patient relationship and of the contributing communications,[3] yet there is limited understanding of the range of specific interaction behaviors associated with positive and negative patient perceptions and reactions.

The researchers conducted a naturalistic, observational study of 61 physicians (high, medium, and low AOM patient satisfaction scores) and 192 of their patients: A) by videotaping their live outpatient visit; B) by privately audiotaping patient and physician reactions on viewing their visit tape; and C) by a confidential interview with the highest of the performing physicians (Figure 1).

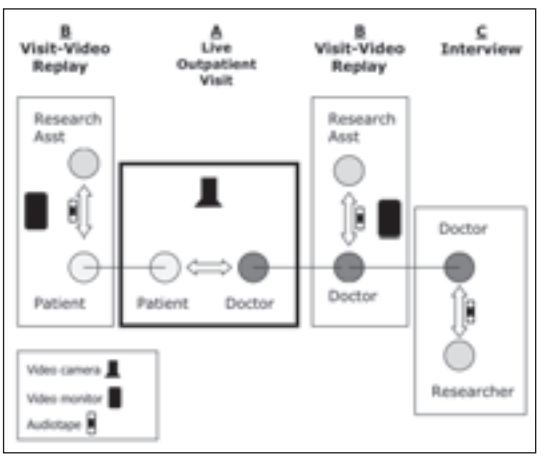

Figure 1. The Research Model

The most important findings, of three reported subset analyses[4-6] are summarized next.

Three Minutes More—The first analysis found that highly satisfied patients' perceive visit time with their physicians to be three minutes longer (22 minutes) than actual visit time (19 minutes).[4]

Listening and Explaining—In the second analysis, the most prevalent communication practice themes—identified by both physicians and patients—were: physician explanation skills and listening skills.

The Patient's Story—In the third analysis, the two most important practices—those exhibited by the highly satisfying physician group—were: attention to the patient's agenda, and drawing out the patient's story. The physicians focused on the patient's needs rather than primarily on clinical issues or visit management. Drawing out the patient's story, through active listening, included eliciting the patient's fears and concerns.[6]

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Table 1. Study populations

Phase	Design	Location	No. of physicians	Comment
	Pilot study interview (each physician, one hour, set of questions)	Portland (2001)	**21**	Highest patient satisfaction (Primary Care and Specialty Care)
Garfield Study 1	**Video study** (tape visits, play back, comment)	Los Angeles Honolulu (Total 2004)	29 26 **55**	Includes high, medium, low patient satisfaction (Primary Care)
Garfield Study 2	**Interview** (each physician, one hour, set of six questions)	Los Angeles Honolulu (Total 2005)	9 11 **20**	Highest patient satisfaction (physicians from study 1)
	Interview (each physician, one hour, set of six questions)	Portland Oakland (Total 2005-7)	42 15 **57**	Highest patient satisfaction (Primary Care and Specialty Care)

Methodology

In the final phase of the Garfield research study (see Table 1), a standardized, six-question set was posed, in semi-structured, 60-minute interviews, to 77 of the highest-performing physicians on the AOM patient survey, including: 20 of the highest performers (top 5%) in the Los Angeles and Honolulu groups; 42 of the highest-performing physicians in Portland, OR, and 15 in Oakland, CA. These interviews were audiotaped with permission, transcribed and coded for patterns. The Portland and Oakland physicians represented 16 disciplines—Cardiology, Family Medicine, General Surgery, Infectious Disease, Internal Medicine, Immunology, Nephrology, Obstetrics/Gynecology, Oncology, Orthopedics, Ophthalmology, Otolaryngology, Pediatrics, Pulmonary Medicine, Psychiatry, and Urology.

Art of Medicine Attributes

In the Art of Medicine survey seven attributes of clinicians' communication skills are assessed with the following questions:

1. How COURTEOUS and RESPECTFUL was the clinician?
2. How well did the clinician UNDERSTAND your problem?
3. How well did the clinician EXPLAIN to you what he or she was doing and why?
4. How well did the clinician LISTEN to your concerns and questions?
5. Did the clinician SPEND ENOUGH TIME with you?
6. How much CONFIDENCE do you have in the clinician's ability or competence?
7. Overall, how satisfied are you with the SERVICE you received from the clinician?[a]

[a] Personal communication from: Weiss K. Measuring the reliability and validity of the Art of Medicine Survey. Denver (CO): HealthCare Research, Inc. 2001 Jan.

Results

This section first briefly summarizes the results from two of the six interview questions, then details a third question—on well-being—citing 21 physician comments that illustrate five identified realms.

Question One: "Doctor is Part of the Medicine"

Do you feel that your relating to your patients is an important part of your treatment of their medical condition? In other words, that, as a doctor, you are part of the medicine, or that you are the medicine?[7]

Results

All of the physicians agreed that, as doctors in a trusting relationship with their patients, they themselves are "part of" the medicine in all instances; and 90% agreed that they "are" the medicine in some circumstances. Physicians described one or more of several activities that qualify as "medicine" and are a required part of medical treatment to heal illness and improve physical condition, including: connection, listening, reassurance and support, touch, knowledge, explanation and education, understanding, insight.[8]

Verbatim

Here is an example of the extent of the therapeutic effect of this medicine:

Dr Smith said, "I had a patient last week who said to me, 'Dr Smith, I've been thinking about coming in so many

times since last year. When I would feel bad and be worried—think maybe I'm dying—and I'd say to myself, "You just think about Dr Smith," and I would feel better.'"

Dr Smith said, "That blew my mind. I've always known for myself that feeling that I've got a great doctor, who's there for me even if I don't see them, gives me a sense of physical well-being. I can't explain that, but I experience that. And when that patient said that to me, that just knocked my socks off. 'I just visualize you,' he said, 'and I feel better.'" *(General Internist)*

Question Two: "Doctor Creates Therapeutic Effect"

Do you believe, in the setting of a visit, that you, as a doctor, can create a therapeutic moment for your patient? In other words, that what you say, or how you say it, or your connection with your patient, has a treatment effect?

Results

All of the physicians endorsed this statement. They differed only on what set of activities were most important and most effective for them.[9]

Verbatim

As one high-performing physician said:

"Oh absolutely. These office visits are more than just reviewing factual things: they are part of the healing, connecting, and relationship process; all of which goes into making people better. Not all disease can be cured but most disease can be made better, either better understood or better tolerated or people can cope with things better and the office visit is a part of that process. The better connection you make, the easier the habit." *(Obstetric/Gynecologist)*

Question Three: "Doctor Well-Being"

Do you feel that your sense of well-being as a doctor is related to how you practice medicine with your patients?

Results

All physicians agreed that how they practice medicine with their patients is related to, and improves, their own sense of well-being.[10] These interview narratives provide deep, coherent learning in five realms:

1. What physicians derive from patient interactions
2. Their awareness of their state of well-being
3. Their personal and professional sense of self
4. The effect of physicians' well-being on patient interactions
5. Physician's self-care practices.

Verbatims

1. What Physicians Derive from Patient Interactions

- "The time I spend with patients is the best time I spend all day. The time I spend in my office dealing with stacks of paperwork and administrative stuff, is the stuff that grinds me down and sends me home feeling depressed at times." *(General Internist)*
- "The emotion of interacting with a patient, and the satisfaction I derive from that, is what makes me come to work. It's what makes me want to work." *(Family Physician)*
- "I have much more of a sense of well-being from interactions with my patients than I used to. I was trained since I was in medical school that all this connection is just draining your energy—right? It's burning me out. And so I assumed that was happening, and was why I had energy issues—and thought I'm not going to have the energy to deal with my kids tonight. So, once a mentor definitively changed my frame of mind about that—that it could be satisfying—then I was able to notice, yeah, there is something that's draining about connection with patients—it does require energy—but there's also something that's nourishing about it, and now I have so much more satisfaction. I love seeing patients now. I did before, but now it's just something special. It really is. It is nourishing." *(Cardiologist)*
- "Yes, I certainly do and that's a big part of my life. I think also how I interact with my coworkers and how I interact with my friends outside of medicine, all of that is part of the same thing. I just basically like interacting with people. I like getting into people's heads. I like getting into what their goals are, what their expectations are out of life. To me that's very rewarding in general." *(General Surgeon)*

2. Physicians' Awareness of their State of Well-Being

- "The times I feel I'm at my best are the times when I'm working the hardest, but I feel most rewarded, and my own well-being or mood is at its highest because I feel like I am doing the things that I was trained to do, that I'm making a difference, and that I'm connecting with people." *(Psychiatrist)*
- "Cleaning out your in-basket is maybe a feeling of accomplishment, but it's not a feeling of well-being. I think it's definitely the patient interaction for me." *(Family Physician)*
- "To me the biggest reward of my practice is the

shopping bag full of patient *thank-you cards* and Christmas cards that I get. To me, that's basically almost worth more than money to have that kind of recognition. And I have a sense of connection. To be fairly highly rated in the patient satisfaction scores, I think that's all about connection and that's all about a two-way interaction with the patients and I think that's what's rewarding for both them and me in these kinds of interactions." *(General Surgeon)*

- "I don't consider myself necessarily a very emotional person. But, when I see patients, and can feel like wow they're really struggling here, it does trigger an emotional response—that I think I sometimes choose to ignore because it's painful for me to feel that. We weren't trained to connect that way. But, as I think back over my experience with the patients I've cared for, so many are not necessarily looking for medications and treatments, they're really looking for relationships and the connection with someone who can at least empathize with their situation or their plights or the circumstances in their lives. To at least acknowledge that: "Yeah, it's hard. It's a difficult situation for you." And to be, I don't know if reassured is the right word, but to say, "I wish things were different," or "I wish I could do something differently here to help you." I think, for patients, empathy is something that connects the relationship with their physician." *(General Internist)*
- "I know that at times when I am distracted, disturbed, I find it very difficult to be present, very difficult to invest. If you just let go of your own problems when you walk into that room, you actually recognize that you feel better. Done right, the process is good for you—learning to let go of stuff we choose to hold on to and we don't have to is often the first step to be well. *(Oncologist)*
- "My sense of well-being is absolutely supported by the interactions that I have with the patients. If I have unhappy patients it makes for an uncomfortable and unhappy time in the office. The difference between Surgery and Primary Care is that the people who come to see us are often afraid, but it's something that I have a fairly simple solution for and when they leave they are going to be well. I wouldn't enjoy what I do nearly so much if I only had ten minutes to see someone. I have a lot more respect for the medical people that are in this group, than I do looking at my own situation, because I feel I have an unfair advantage, and our ability tends to be a sort of bond that forms from the operation." *(General Surgeon)*

3. Physicians' Personal and Professional Sense of Self

- "This whole line of thought is interesting to me just because I feel that medicine is so much more than what we learned in medical school—the nuts and bolts and knowledge we all had to absorb—but medicine is so much more than that—its personality, its spirituality (for me), reminding yourself to be present for that person, it's satisfying. I feel like I get something from my visits with my patients. I don't know what it's going to be. It might be that feeling of satisfaction or it might be learning something. I think that's why I like it—it's almost nourishing in a way." *(General Internist)*
- "Yes I certainly do derive a sense of well-being from patient interactions. I have a bad evening at home or in the morning and I'll go to work and see several patients and have a good interaction, it changes my whole outlook on life. It really is important. In general, my home life is wonderful, but it can be completely turned around by experiences at work, good or bad actually. My interaction with patients is very gratifying. However, the environment in which I'm having to do it is getting harder and harder to deal with, because the pressure is on me to see more people, or to do the coding, or the electronic medical record, or one more little thing that "doesn't take any time." It takes away from my time with my patients and that upsets me. I've avoided committees and other things that physicians use to dilute patient care a bit. As a result I have more patients than I can take care of. I need to balance that out. My overall sense of well-being is fine, but I'm getting kind of tired of being interrupted." *(General Surgeon)*

"Cleaning out your in-basket is maybe a feeling of accomplishment, but it's not a feeling of well-being. I think it's definitely the patient interaction for me."

- "I have the luxury of being a subspecialist where I get to focus on one aspect of a patient's health, rather than having to simultaneously manage a number of chronic conditions for which there may not be a great answer. And I have the luxury of having a diagnosis for which there is a good treatment. A happy patient makes for a happy doctor. I think that part of the reason for my successful relationships with patients is due to the success of the treatment. I do feel very fortunate from a professional standpoint that this is what I do for a living, because I do feel rewarded, and I do think that my emotional and mental well-being as a physician couldn't really be higher from a mental standpoint." *(Orthopedist)*

4. The Effect of Physicians' Well-Being on Patient Interactions

- "It's the domino kind of thing—where they give you positive feedback, and then you feel better, and do better, and then they give you more positive feedback." *(General Internist)*
- "They had a training program for professionals to teach them how to hold cancer retreats. My wife and I went there. One of the things they had people do, which I sometimes ask people to do, is write poems about their illness. It's a way that people can access some deep stuff, and then, as their doctor, it's amazing the poems people write. And knowing them as their doctor, and then reading the poem they wrote, it was such a great way to understand them better. Why they wrote this particular thing—it's not about your dying, it's about what you do before you die. I think it's good training to help doctors understand who they are." *(Oncologist)*
- "The interactions I get with patients is the big part of my day. I get a charge out of having somebody sad, smile; of having a kid that curls up Mom's lap and refuses to have anybody look at them, but by the third visit is giving me high fives. It's good for my self worth and my ego when I realize that I'm not the best surgeon in the medical group by far, but patients or parents will say, 'I want you to operate on my family. I want you to do this.' It's my interactions with them that make them want to do that." *(Otolaryngologist)*
- "Sometimes I get into a frustrated situation with a patient that just has too many issues to deal with in a single visit. I carry that with me sometimes for the whole day. That's one of the reasons I work hard to have good patient interactions. I like feeling good. If I feel good, they feel good, then I feel good. I'm jazzed up." *(General Internist)*

5. Self-Care Practices

- "I like to take care of myself and make sure I'm feeling strong. However, it's been one of the biggest challenges for me to learn how to comfort myself and not be overwhelmed by stuff. That's the hardest part of maintaining my well-being. The physical well-being—being healthy and all that—I try to be healthy, but the emotional well-being—it's been hard. We're not really encouraged to reach out to other people. If you want relevance and you want connection, then you have to feel the wounds too. You can't get both. You can't have doctors feel very connected with their patients and then get wounded and not have any way to heal that." *(Oncologist)*
- "I don't think, 'Well, this is my eight hours here in the clinic and I put on my doctor hat while I'm here and when I'm home I just don't deal with medicine.' For colleagues that I've worked with who have had problems with patient relationships, there has always been an undertone of resentment—either resentment for the patient or resentment for their inability to fix the problem. They take it very personally that they aren't able to fix that person. None of us may be able to. Or, they resent somebody making a demand on them that they perceive as out of their routine, or their schedule. It's just how we choose to live that reality. Nothing ever really changes; it's just our perception of it.

  I do take a few minutes every day to just remind myself that if it's busy and I'm feeling overwhelmed and I tap into that, recognize it, I'll meditate. When things are most out of control is when I'm most likely to take two or three minutes, just close the door, and chill, get things in perspective, and then get back at it. Just putting in perspective how good things are for me, I'm really blessed. Rarely is there anything here that's worth getting stressed out over or burned out over." *(Urologist)*
- "There are always admonitions about how everybody should get a life, etc. I have a wonderful relationship with my wife but a lot of my real soul comes from what I do in my office. I wouldn't give up my practice for anything. I have had a lot of experience with several of the health systems in the area and all of them seem to do the same things with primary care. They get the bean counters in and they have to be efficient—that means primary care clinicians have less and less control over their schedules. It's just plain a loss of any sense of *autonomy*. That's what we are losing. There is this sense of 'I want every minute that you have to be occupied with who I tell you is going to occupy it.'" *(Psychiatrist)*
- "The relentlessness of the pace is something I struggle with. The only way I can continue to do this business, and to give what I need to give to my patients, and want to give to my patients, is if I take care of myself in a way that allows me space, balance, to be reenergized—to eat well, sleep well, exercise, do my art, cook, garden, and things that completely use a different part of my brain. Obviously, a lot about the work itself is energizing." *(Infectious Disease)*

"… patients or parents will say, 'I want you to operate on my family. I want you to do this.' It's my interactions with them that make them want to do that."

Discussion

Together, the four Garfield Memorial Fund studies described offer summary learnings.

Patient satisfaction with communication in a visit expands patients' perceptions of time. Having an additional three minutes in a visit could allow you to have tea and chat, such is the feeling of space that extra time creates.

The doctors, whose patient's are most satisfied, describe needing to listen well enough for their patients to feel heard, and to be heard, so that the patient-desired explanation creates understanding and confidence. It reassures. The practices that these highly satisfying physicians engaged in were: attention to setting an agenda; and drawing out, and listening to the patient's story. These doctors focused on their patient's needs rather than primarily on clinical issues or visit management. Drawing out the patient's story, through active listening, included eliciting the patient's concerns and fears. This is a great context for improved diagnosis and treatment. The findings are also consistent with Kaiser Permanente's efforts to train physicians in communication skills using the Four Habits approach.[11]

Doctor is Medicine

In the context of a trusting relationship with their patients, all high-performing physicians agreed that, as physicians they are "part of" the medicine in all instances; and 90% agreed that they "are" the medicine in some circumstances. They describe one or more of several empathetic activities that qualify as "medicine" and are a required part of medical treatment, including: respect, attention and presence, listening, connection, reassurance and support, touch, knowledge, explanation and education, understanding, insight.[7]

The point is that this visit interaction is not just a mechanical exchange of information. It is also a transpersonal encounter—people relating their story and building relationships. The activities or states that are medicine are not just a toolbox of items to dispense, but the person who is the doctor is medicine for the patient.

Medicine is Therapeutic

The often-cited statistics that 60-80% of primary care visits are for reassurance of psychosocial concerns[12-15] undermines the potentially powerful therapeutic treatment effect that connection, reassurance, explanation, understanding, and other subjective activities can have. The physicians we interviewed believed that these activities or states helped to heal a patient's illness and treated their medical condition—that who the doctor is, and what the doctor says and does in the visit is therapeutic, either independent of, or in complement to, prescribed medications and other treatments.

Well-Being is Enhanced

If physicians practice this way, what effect does it have on them? Does it burn them out? Or does it nourish them?

With short- and long-term relationships, as the necessary foundation,[3] interaction often produces well-being for both patient and doctor. Physicians described that when they experience patient interactions where they feel part of the medicine, it is responsible for their sense of feeling valued, making an important contribution, making a difference, and creating personal and professional well-being.

Physicians described five components that integrate to enhance well-being: 1) deriving something from patient interactions; 2) awareness of their state of well-being; 3) personal and professional sense of self; 4) personal well-being has an effect on their patient interactions; and 5) physicians practice self-care.

1. Physicians' interaction and connection with patients, though requiring energy, focus, and tolerance is nourishing, energizing, and brings fulfillment and meaning. It prevents burn-out, which appears to grow out of mechanized work, often menial, squeezed of human emotion, meaningful moments, and personal conversation. Rather than draining your energy—as physicians, including me, were taught in medical school, and re-enforced by a medical culture rooted in this unexamined belief—physicians find nourishment in their patient interactions. It is often a simultaneously therapeutic moment for both physicians and patients. Without these interactions, physicians struggle to sustain themselves when acting totally objective, and tending solely to the task at hand, rather to the person they are with.
2. Physicians are aware of their state of being—well-being or distress—in their practice, and with their patients. They are aware of connection and meaningful moments.
3. Physicians' personal and professional selves are closely related, affect each other, and often work simultaneously to achieve the goals of each. A person is delighted to be in the professional role of a doctor and help people become aware of their state of physical and emotional health, and to understand what they can do to effect any necessary change.
4. Physicians' well-being affects their patients, as one doctor said, in a domino effect of positive feedback loops.

5. Because it can be hard to continually engage patients, especially given the technical and time-constrained environment, physicians take care of themselves, and care for themselves, in a variety of ways and practices, such as: taking a moment and a deep breath, meditation, being with their families, reflecting on their life, writing poetry. They describe these practices as necessary to maintain or return to a state of well-being.

Creation of well-being is part of the psychological-physiological mechanism to maintain human homeostasis.

Conclusions

As our use of, and dependence on, medical technology increases, knowing that the physician is medicine for the patient—and that that creates high patient satisfaction—affirms the value of developing a good relationship, and offers a potent, available alternative to some testing and medications, especially for patients with chronic diseases.[8]

With primary care in crisis nationally,[16] and specialists increasingly procedure focused, understanding the nature of physician satisfaction, especially in relationship to patient satisfaction, is of the greatest importance to the sustainability of the highest-quality medical care and service. Physicians' greatest stress is the lack of time to create and maintain patient relationships, often associated with the increasing tasks and technology demands. Their greatest reward is patient interaction and connection in the context of their clinical practice—getting to know people and helping them.

Physicians note the benefit of communication education in improving their satisfying interactions with patients—there are ways to improve, and ways to transform. Medical education, the format of the office visit, and leadership expectations must optimize and emphasize the essential value of subjective empathetic activities and states in creating the highest patient satisfaction and the most effective medical treatment outcomes.[9]

Part two of this editorial will appear in the Winter 2009 issue of *The Permanente Journal*, and is entitled: "'Can All Doctors Be Like This?' Ten Stories of Transformation of Physicians Who Satisfy Their Patients Best." ❖

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Labyrinths Find Their Way onto Hospital Grounds as Paths to Healing

Jim Gersbach

Once found exclusively in sacred spaces from moors to cathedrals, labyrinths have been undergoing a renaissance of late. After falling from favor for more than two centuries, labyrinths are once again being installed by congregations in their churches. Increasingly, they are also appearing in secular places, including two that opened at Kaiser Permanente (KP) hospitals just last year.

To Reverend Jurgen Schwing, Spiritual Care Manager in KP's Diablo Area, interest in labyrinths in health care settings is not surprising. "In humanity's early years, the priest and doctor were one," says the German-born Rev Schwing. "Then, with the discovery of scientific research, the professions split. Physicians were taught to objectify the body. But now we're discovering the mind has a lot to do with the body."

Photo courtesy of Sharon O'Keefe

Labyrinth at the Sunnyside Medical Center, Clackamas, OR.

From Crete to California

The word labyrinth conjures up images from the ancient Greek myth of the Athenian hero Theseus. In this myth, Theseus slays the half-human, half-bull Minotaur that lived inside a labyrinth in Crete with so many twisting passages that all who entered became hopelessly lost.[1]

As the Roman writer Ovid described it in his *Metamorphoses*[2]:

> *He tricks the eye with many twisting paths that double back—one's left without a point of reference … just so did Daedalus within his maze along the endless ways disseminate uncertainty; in fact the artifex himself could scarcely trace the proper path back to the gate—it was that intricate.*

After killing the Minotaur, Theseus is able to escape from the labyrinth only with the help of the Cretan king's daughter, Ariadne. Smitten by his beauty, she secretly gives him a spool of thread to unwind so he can retrace his steps.[1]

The word labyrinth itself recalls the Minotaur. The ancient Greek meaning is "house of the double-edged ax." This ax—*labrys*—was a sacred symbol of the Minoans who lived on Crete. They worshipped a sun god whom they often depicted as a bull.

Remembering the Minotaur myth, we can be forgiven for thinking labyrinths are the same thing as mazes. But the two are not the same. Mazes employ dead ends and misleading corridors to baffle and confuse those who enter.

Walking labyrinths, on the other hand, are intended to let those who enter find their way along a single, clear path. However long and intricate a labyrinth's pattern, anyone can trace the turnings and be assured of reaching the center and back out again.

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From India to Arizona, labyrinths can be found in numerous premodern cultures. They enjoyed great popularity in Medieval Europe, where Christians often substituted walking a labyrinth for the more arduous pilgrimage to the Holy Land (hence one of the labyrinth's names in French—*le chemin de Jerusalem).* Later, during the Reformation and Enlightenment, many labyrinths were destroyed. Among the few to survive those upheavals was the labyrinth in the floor of Chartres Cathedral, on which the two KP labyrinths are modeled.

Rediscovering a Spiritual Connection to Healing

The first labyrinths completed at KP hospitals became available to walkers in the summer of 2007 at the new Antioch Medical Center in Northern California and at Sunnyside Medical Center in Clackamas, OR. Subsequently, a labyrinth has opened at the Santa Rosa Medical Center in Northern California.

Antioch Medical Center

According to Rev Schwing, the idea for the Antioch labyrinth came from Jane Wirth. The Rev Schwing met Wirth shortly after he came to work as a chaplain at KP's Walnut Creek Medical Center in May 2000. Wirth, who has since retired, was then a Director of Health Education for KP.

"She had long been interested in labyrinths and wanted one at KP," Rev Schwing recalls. Her first attempt to get funding for a labyrinth, at the existing Martinez Medical Office, failed. When she met Rev Schwing, he was already familiar with labyrinths from one at the California Pacific Medical Center where he completed his clinical internship. Wirth brought up the idea of collaborating with Rev Schwing to obtain an innovations grant from KP for "finger labyrinths"—boards with the paths grooved into the wood so people could trace them with their fingers.

"In the beginning there was a bit of hesitancy in bringing spirituality into a secular health care setting," remembers Rev Schwing. "But KP leaders were really interested in learning about spiritual care as a professional discipline that includes religion but is much larger than that and includes the quest for existential meaning."

Wirth and Rev Schwing got the grant. They encouraged people visiting a KP hospital meditation room to try the chessboard-sized finger labyrinths. Surveys of users' stress levels before and after tracing the paths revealed that most felt more relaxed afterward.

Rev Schwing suspected that walking labyrinths might be even more effective than the boards. "Sometimes when people are stressed they are not ready to sit down to become calm. A labyrinth can have a healing effect because as we walk its path it stills our mind. It's a great example of how something developed in a religious context could be adapted

Photo courtesy of Tom Janisse, MD

Labyrinth at Antioch Medical Center, Antioch, CA.

Welcome to the Antioch Medical Center Labyrinth

Kaiser Permanente cares about you! We have provided this labyrinth as a way for you to relax and rejuvenate.

There are three stages to the journey through the labyrinth:

Release: Begin by standing at the entrance on the edge of the labyrinth. Take some deep breaths. Gently follow the path at a pace that feels comfortable for you. Clear your mind and let go of all thoughts and cares.

Refresh: When you reach the center you may want to stand quietly for a few moments. Visualize yourself in a peaceful place, breathe, reflect and relax.

Return: When you feel the time is right, follow the path back out from the center. Bring the feelings or insights you experienced with you as you return to the world.

We hope you feel refreshed and ready to thrive!

Text from a sign at the entrance to the Antioch Medical Center Labyrinth in CA.

Photo courtesy of Sharon O'Keefe

(Left) Clinician walking the Sunnyside Medical Center Labyrinth.

(Below) Patient and family walking the Sunnyside Medical Center Labyrinth.

Photo courtesy of Sharon O'Keefe

to something in health care involving stress reduction."

On the basis of the success of the finger labyrinths, funding was approved for a full-sized outdoor labyrinth at Antioch. The designers planned for the whole atmosphere to be conducive to healing.

Wirth attended Antioch's dedication last November and became the first to officially walk the hospital's new labyrinth. Today, Rev Schwing walks the Antioch labyrinth regularly. Staff and visitors of many different faiths ask him about the labyrinth and he often overhears children peppering their parents with questions. "I've seen a real interest and curiosity," he says.

But belief in a religion is not necessary to benefit from the labyrinth, according to Rev Schwing. "It can be a very practical tool to help people in relaxing, stilling the mind, transitioning after treatment, or just as a way to reduce stress on breaks or at lunch.

Volunteers Fund Oregon Labyrinth

Sunnyside's labyrinth stems from a trip the hospital's future Director of Volunteer Services, Bonnie Morgan, made to San Francisco in June 2000. While there, Morgan visited Grace Cathedral and walked its outdoor labyrinth.

"I had a lot of stuff in my life at that time that was troublesome. I found walking the labyrinth very soothing and peaceful, helping me let go of some things," Morgan says of that first experience.

A few years later, she had the opportunity to fund a labyrinth when plans were announced to turn a parking lot on the Sunnyside campus into a 200,000-square-foot patient care wing. Construction of the five-story addition created a courtyard. The hospital's volunteers donated $200,000 from their gift shop sales to beautify the space with a garden, stone benches, a fountain and—at Morgan's suggestion—a walking labyrinth.

At 24-feet across, Sunnyside's labyrinth is roughly half the size of its original French counterpart but features the same tightly coiled path in tan cobblestones outlined in bluestone. Few of the people drawn to the courtyard for fresh air and respite from the busy hospital units on either side know the long history behind this centerpiece. But on any given day, some can be found stepping onto its stones, invariably silent, heads bent intently toward the earth.

That intense focus on what labyrinths have to teach us is shared by one of Sunnyside's part-time chaplains—the Rev Susan Freisinger. She first walked a labyrinth eight years ago at an Episcopal church in Portland. No one was happier to see a labyrinth appear at Sunnyside. "I love it that the labyrinth involves physical movement. Bringing the body into a meditation experience is important. I am reminded of what is important to me, and the daily irritations and frustrations fall away, letting me return to a sense of wholeness."

Rev Freisinger explains that the labyrinth is a spiritual tool without belonging to any particular religion. "I can suggest to patients who are facing a difficult diagnosis that they

Walking labyrinths … are intended to let those who enter find their way along a single, clear path.

walk the labyrinth to help them connect with their own sources of strength. Staff can use the labyrinth to get centered before and after working with patients. Families who are struggling with end-of-life care decisions for their loved ones can take time to walk the labyrinth and see things in a clearer light."

The labyrinth at Sunnyside is wheelchair accessible, making it possible for people with disabilities to also navigate its paths. Nurses can sometimes be seen wheeling patients along the coiling paths and explaining the labyrinth as they go. "It is a little tight—sometimes I get dizzy," says Rev Freisinger, who uses a wheelchair herself. But she believes the spiritual benefits are the same on foot or on wheels. "I see people remember their inner strength and their connection to faith. I see people stop struggling and relax."

When asked if walking a replica of a nearly 800-year-old spiritual path holds much relevance for those walking and relevance for those working and receiving care at a busy, modern specialty hospital, Rev Freisinger is quick to reply that, "We are just as much in need of tools for reconnecting with ourselves as ever. Labyrinths are about healing, about coming into wholeness. The labyrinth meets us where we are—there is nothing we need to know to do it right. Sometimes the labyrinth experience is full of insights or good feelings, and sometimes nothing seems to happen for us. It doesn't matter. We just walk the path and listen to our experience." ❖

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Online resources about labyrinths

- www.labyrinthsociety.org—contains a worldwide labyrinth locator with directions to thousands of labyrinths and their descriptions. It also gives a nice overview of labyrinth designs and history.
- www.veriditas.org—offers a good overview of labyrinths, guidelines for their creation and use, and schedule of labyrinth-related events and lectures. Also, it links to the worldwide labyrinth locator.
- www.labyrinth.org.uk/index.html—is a British guide to the contemporary labyrinth movement for alternative worship and meditation.
- www.crystalinks.com/labyrinths.html—has useful information about the history of labyrinths.

Gleams Of Light

I have designed my style pantomimes as white ink drawings on black backgrounds, so that man's destiny appears as a thread lost in an endless labyrinth. I have tried to shed some gleams of light on the shadow of man startled by his anguish.

— Marcel Marceau, 1923-2007, French mime artist

Cody

William Lynes, MD

The joyful holiday season was at its peak as the city busily celebrated a peaceful Christmas. The Emergency Department (ED) buzzed with the usual trauma. The crash rooms were full and blood splashed over linen-covered gurneys. A silly carol played overhead. Chaos then entered the ED with the arrival of a major motor vehicle accident involving an African-American family with a dead-on-arrival female, a severely injured male driver, and a gravely hurt five-year-old boy.

I had laid down for a few minutes of rest when I received the page. Not asleep yet, I returned the call to the ED. "This is Dr Cody, I was paged," I replied in my most professional voice.

In this manner I became aware of the case that would change my life, an impersonal story repeated quickly over the phone system of a busy university hospital. As the intern on the urology service, the Chief Resident had paged to make me aware of the five-year-old boy, status post motor vehicle accident, with a left renal fracture. He indicated that they would emergently explore the boy in operating room two. I knew immediately that I was to make my way to the operating room (OR), write post-op orders, and follow the patient.

The boy was already on his way to the second floor OR, so I went up the back staircase, two steps at a time. I stopped in the locker room, changed scrub suits, rolled deodorant over my day's sweat, and entered room two.

For just a brief moment I saw the boy in the hallway outside of the OR as he was wheeled in. He was a beautiful child lying quietly in a crib-type bed with an IV in his left arm. He wore a yellow gown over a pair of blue-striped pajama bottoms with stretchy shoe covers over his little bare feet. The boy had big brown intelligent eyes and, what was most unsettling given his predicament, a peace and strength that was apparent from the moment I met him. I had a chance to tell the boy that I was Dr Cody as he was rolled into the OR.

He surprised me when he looked up at me, smiled, and said. "My name is Cody too!"

I touched his hand through the rails of his crib. Cody quickly grabbed my hand. I said, "Don't be afraid, Cody. I'll be with you." He stared up at me and nodded his head affirmatively.

As they induced anesthesia I turned and reviewed the case's x-rays. A kidney, ureter, and bladder (KUB) film showed a ground glass appearance to the left side of the abdomen and a fractured left 12th rib. A quick ED computed tomography (CT) scan showed a comminuted fracture of that kidney and a surrounding renal hematoma from the expected bleeding.

The kidney lives in the back of the abdomen tucked over the 12th rib, a rib that is short and protected. Only violent trauma causes that rib to fracture, violent trauma that nearly always severely fractures the kidney as well. Surrounding the kidney is a large perirenal fat pad encased in the tough layer of gerota's fascia. When the kidney is injured bleeding occurs, the hemorrhage is contained and tamponaded by this fascia. During surgery this fascia must be opened to expose and examine the kidney, a move that releases the tamponade and can result in massive bleeding. The surgical goal in renal trauma is to not release the hematoma-filled area around the kidney before the vascular supply to the kidney can be identified and controlled. This is generally obtained by dissecting up the vena cava allowing the surgeon to identify the left renal vein and artery, and to place vascular vessel loops around them. This step will then allow quick clamping of these vessels if bleeding begins to get out of control.

I had a chance to tell the boy that I was Dr Cody as he was rolled into the OR. … "My name is Cody too!"

Cody was explored through a midline abdominal incision beginning at the pubic bone and ending at the sternum. There was a left retroperitoneal hematoma surrounding the kidney; the spleen, liver, and other important organs free of injury. In the manner described, the left renal vessels were identified. With the blood flow controlled, the left kidney was examined. A severe comminuted fracture was confirmed and left nephrectomy was performed.

The next time I saw Cody was on rounds the following morning—Christmas day. He was sitting up in his crib bed with an IV running. He looked at us with

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some reservations but smiled a big open-mouthed smile when he saw me.

"Hi Cody," he said.

The Chief Resident, other residents, and students turned to me; each laughing quietly. I was surprised that Cody would remember me from our brief contact in the hallway outside of the OR the night before.

"Hi Cody," I said moving to his bed and lowering the crib-rail. I guided him to lie down on his back. "I am going to take down your dressing now. The tape will pull just a little."

He looked into my eyes with trust and nodded his head slowly yes. I was surprised when he stoically did not cry as I pulled the paper tape off of his belly. His wound, which had been closed with skin staples, was dry and intact. Cody's abdomen was soft, and he had a few bowel sounds this morning. I looked to the chief, wondering if I could begin him on clear liquids. When I explained the very unappealing diet, he was happy.

His answer was stunning. How in the world did he know what had happened to his mother?

"I really like juice, Cody! Popsicles too," he said with a big smile.

I was tired, having been on call all night, but something about Cody revived me. He was hurting and all alone; he had a quiet strength and the simplicity of a child that I had all but forgotten until that day.

As the entourage exited the pediatric unit, the discussion centered on what we were going to do with Cody. His mother had died instantly at the scene; his father was in a coma secondary to severe head trauma and on the neurosurgery service. I had checked into the man's case; he was not expected to survive. In addition, Cody seemed to have no other surviving family.

"Get the social worker to see him; we will be discharging him in four to five days … Cody!" The Chief Resident jokingly called me Cody as the boy had.

I could not keep the boy out of my mind that day. I was busy as always, changing dressings, replacing an arterial line, seeing patients in the urology clinic, and completing all of the scut work from morning rounds. I wondered about him all day as I completed my job. I figured the boy was not aware of his mother's death. Someone would have to tell him about this tragedy. I paged the Chief Resident asking whether I should break the news to him.

"You seem to have a good rapport with the boy," the Chief Resident said to me. "Go ahead and tell him, if you feel you can. His Dad is not doing well I hear, so it would be better to let him know today. In a few days we might have to tell him about another death."

Finishing afternoon rounds, I returned to Cody's bedside. He was playing with a stuffed animal when I saw him. He smiled and waved to me as I walked up.

"Hi Cody," he said to me.

I dropped his crib rail and rubbed the boy on his head; his short afro soft to my touch. He stopped playing with his stuffed animal and looked seriously at me with the slightest hint of a smile. I struggled to find a beginning to our conversation.

"Cody, are you taking those liquids okay?" I wondered.

"Salty," Cody said repeating a complaint about clear liquids that I have heard so many times before. "But the nurse, the little one," he said referring to his slight, blond-haired nurse. "The little nurse, she juiced me apples. They're *liscious* … here drink some, Cody." He said holding his cup up for me to see.

"Thank you, Cody," I said, taking a pretend sip from his cup.

"Cody," I said trying to gently change the subject. I broke eye contact with him and looked down at my feet. "Do you know what happens when someone dies?"

"Like Momma?" He wondered.

He looked at me seriously with his deep brown eyes. His answer was stunning. How in the world did he know what had happened to his mother? I stood looking silently at the little boy, wondering if social services had told him about the death.

"Yes, like your momma. Cody, did Mrs Gable tell you about her? Your momma that is, ah … you know … did she tell you about her death?" I wondered, referring to the social worker who had seen him this morning.

"Momma's in heaven, Cody! She told me good-bye in the *fruck*," the boy said. He was referring to the crew cab truck that he and his family were in that awful night. The boy looked up at me and sat quietly, waiting for my response.

I envisioned the twisted wreckage, the dying woman gasping out a last *I love you* to her only child. I looked to the boy who sat in his crib. His eyes met mine with an inner strength impossible for a child of five.

"It's okay," Cody said evidently seeing my torment with the thought of how he could remain so strong. "Heaven is fun."

I looked at him with sadness not knowing what to say to him. Soon however, I found myself smiling. "Yes Cody, heaven is fun."

Cody's father died the next day. We found out on afternoon rounds, seeing our urology patients first and then making our way to the neuro-intensive care unit. My first thought was that the boy was an orphan now.

After rounds I went back to the pediatric ward to try to tell him about this horrible event.

He met me with his usual big smile and as always said, "Hi Cody."

I made the mistake of asking him what he wanted for Christmas, trying to divert the conversation away from my task.

"I just want Daddy back," was his only request.

I looked at him and I felt a tear start in my left eye, a tear that I forced myself to suppress. I dropped the side rail of his crib and picked the boy up. We sat in a chair, Cody sitting on my lap.

"It's okay," he said to me, as usual he was totally aware of my anguish.

"Your father, Cody … he passed away, I am afraid to say."

The boy looked at me, silent for the moment and then looked down at the stuffed animal. "What's passed away, Cody?" He said quietly.

"Died, Cody, I mean died," I said, not knowing what else to say.

As he looked up at me a smile came over his face. "Now Momma won't be alone," Cody said with a sincere look of relief on his face. "She would be lonely in heaven all alone, now Daddy is with her," he explained.

My life is different now. Medicine had been my only goal for so long. Working and studying through college and then medical school; the hours of my residency were long and hard. I was so self-centered thinking only of myself. God put this boy in my life to tell me there was something much more important than medicine. When I adopted Cody, my life became more complicated, but he has taught me so much about character and love. I am writing orders now, sitting at another nursing station in another hospital five years later. Cody comes with me on my weekend rounds. His reward for being quiet during what is usually quite a bit of time is the choice of fast-food lunch that we will eat together that day. The nurses spoil him, bringing him a soda or a left-over breakfast roll. He has taken to collecting rolls of tape from the nurse's station, tape that he can use to bandage one of his stuffed animal friends at home. I think now, as I look at Cody, Cody his name as it is now, that one day this exceptional boy might well be a fine physician. I realize, as he turns and smiles at me that knowing him has made me a much better one. ❖

The Measure Of Our Lives

Sooner or later, we all discover that the important moments in life
are not the advertised ones, not the birthdays, the graduations,
the weddings, not the great goals achieved. The real milestones are less
prepossessing. They come to the door to memory unannounced,
stray dogs that amble in, sniff around a bit and simply never leave.
Our lives are measured by these.

— Susan B Anthony, 1820-1906, teacher, temperance and abolition organizer, and suffragette

Colic

William Lynes, MD

He stood in the darkened cave, watching as golden water churned over his knobby feet. His was a stony form; a polygonal round shape with coarse gray skin covered with streaks of blood. He cut an angular silhouette; muscles pushing up sharply against roughened skin emphasizing a grizzled form. Crowned with thick spiky black hair and vacant obsidian eyes, a torn red bandana draped his neck.

Trapped in a pyramidal cavern, the walls consisted of cream-colored rock splashed with a hint of pink. Tossed sporadically, bluish lines just below the surface seemed to pulsate like a heart beat. A rocky outcropping over his head spurted warm yellow fluid like a fountain. Water lapped up over his short broad legs and filled the air with an ammonia smell.

The stony man looked down and measured his choices. The sea was rising and turbulent; waves of the yellow water now crashing over his thickened legs. He took a half step back and then rolled forward, entering the water with a cannonball splash.

The water pulled him down, swallowing his round form and forcing his shape deep without hope. He knew where he was going, opening up and pulling himself to the center of the cavern floor with short stubby strokes and a powerful frog kick. Here he entered a small crevice, pulling himself through and struggling for air.

He broke the surface frightened and gasping for a breath. Ahead tracked a long tunnel; built of the same colorless stone, concentric archways disappearing in the darkness. The walls pinched tight, forcing him along the watery pathway. He pushed his spiky head up along the top of the space, the red bandana now further torn and draped over his knobby back. Kicking and grabbing he pulled himself along. Gasping for a comforting breath, the walls took him helplessly forward.

The watery path led him further, forcing him through a blackened hole. The sides pinched again, pushing the air out of his aching lungs. They aligned him endwise and threw his stony shape through the narrow gap.

When he was through the tunnel he broke the surface and gasped a long, relieved breath. In a large chamber now, he treaded for what seemed a lifetime.

When he was through the tunnel he broke the surface and gasped a long relieved breath. In a large chamber now, he treaded for what seemed a lifetime.

She was in intolerable pain; sweating, screaming, and grabbing the side rails of her hospital bed. Colicky pain *like childbirth* they said, but in childbirth the result is a child. The woman had experienced this pain before, but today's was far worse than previously. Her torment was so horrible; she was frightened, unable to believe she could stand another wave. And then all of the sudden, it was gone. Not just a momentary relief from wave after wave, but the pain was gone entirely. She did not know how she knew, but she was certain that the pain would not return.

"Let's get you up to void, Honey," the nurse said to the woman. She slipped a shiny metal bed pan under the woman and pulled her gown out from under her.

Relief continued, and the woman let a warm full bladder fill the metal pot. There was a rushing sound, a small ping, and then she was finished.

The nurse pulled the pan out from under the woman and carried it to the sink. Pouring the yellow fluid through a strainer she saw immediately the good news.

In the paper funnel it sat motionless. A round, rough, spiky, gray stone the size of the tip of her finger laid inoffensively, a bloody stripe of clot draped over one end like a bandana. ❖

William Lynes, MD, is a retired Urologist from the Riverside Medical Center in CA. E-mail: wlynesmd@gmail.com.

The Dance

Jonathon W Gietzen, MS, PA-C

Our eyes met as soon as I entered the room.
Her head tilted up with a look of expectancy.
She was older than me by more than a few years but I
Thought she should have a few more dances left in her.
I sat down a few feet away as we made small talk.
I could see the apprehension fade from her
face as she warmed to my interest in her.
Finally the moment arrived when I needed to
screw up my courage to make the next move.
No matter how many times I'd done this before, there was
no way of knowing if she would ultimately accept my offer.
So throwing caution to the winds I pushed onward.
So … Mrs Jones, how can I help you today? ❖

Jonathon W Gietzen, MS, PA-C, works part time at Interstate Urgent Care in Portland, OR. E-mail: jongietzen@pacificu.edu.

True North

Mary Dowd, MD

Men at the jail
come in three varieties:
lost boys,
cool dudes,
old wrecks

The lost boys
have just awoken
from their trance
of heroin or coke,
or alcohol and oxy's

Their hair is tousled
or sticks straight up
they can't quite catch on
to where they are
or what they've done

They want to know
how long they've got
so they can get their sh-- together,
straighten out
before they're gone at 28 or 30

And each time they come back
I tell them that they're fine,
their liver will recover
if only they'll stop
drinking, drugging, dying

The cool dudes
range from 25 to 40
blue eyes, white teeth,
well groomed, well muscled
even charming

Backs straight,
chests out
they swagger,
kings of pod 2b,
they've always got an angle

The wrecks
slouch into medical
leading with their paunch,
they have diabetes, heart disease
cirrhosis and ascites

Off the juice
they're sad or angry
or encephalopathic
truly believing this time
they'll be ready for rehab and a job

And the lost boys
don't see,
what the cool dudes
don't believe,
that the path

from boy
to dude
to wreck
proceeds relentless
unswerving,

true as a magnet to the pole,
in one unbroken line ❖

Mary Dowd, MD, is a Physician for the state of Maine and Cumberland County in Portland, ME and has a part-time private practice in Yarmouth, ME. Dr Dowd is a Professor at the University of Vermont and St Matthew's Medical College. E-mail: mdowdmd@yahoo.com

In the Pod

Mary Dowd, MD

The door clangs shut.
All eyes turn toward the diversion.
The nurse and I walk in,
two little female sticks,
bobbing in a sea of men.

The room is large, but small,
dimly lit, swarming
with elbows, feet, faces
dozens of men
in orange scrubs
talking, joking
shoving, pushing
pacing, roaming.

The ceiling is high, but low,
from two tiers up
it presses down on me,
filled with a gray-brown cloud,
invisible,
of something nameless,
edgy, hostile
and immeasurably sad.

I feel the stares
of men looking,
and not looking at me
wanting contact, conversation,
attention, sympathy,
distraction,
anything,
anything at all
Wanting,
so much wanting
I feel it pressing in
squeezing me
bruising me like thumbprints,
collapsing me.

I shut down all my doors and windows
and focus on a spot across the room
where a thin bar of sunlight
filters through barbed wire
to light a concrete court. ❖

Abstracts of Articles Authored or Coauthored by Permanente Physicians, Nurses, and Investigators

Selected by Daphne Plaut, MLS, Librarian, Center for Health Research

From Southern California:

Asthma-specific quality of life and subsequent asthma emergency hospital care.

Schatz M, Zeiger RS, Mosen D, Vollmer WM. Am J Manag Care 2008 Apr;14(4):206-11.

Objective: To identify an optimal cut-point score on the Mini-Asthma Quality of Life Questionnaire (mini-AQLQ) to predict subsequent asthma exacerbations, and to determine the additional risk conferred by a prior history of acute episodes.

Study Design: Cross-sectional survey linked to administrative records.

Methods: A total of 1006 HMO patients with active asthma completed surveys that included the mini-AQLQ and prior-year history of acute episodes. Surveys were linked to administrative data that captured asthma Emergency Department and hospital care (emergency hospital care) for the year after the survey. Optimal mini-AQLQ cut-point scores were determined by stepwise logistic regression analyses using subsequent-year asthma emergency hospital care as the outcome and various mini-AQLQ cut-points as the predictors. Predictive properties of the two risk factors (mini-AQLQ cut-points and prior acute episodes) were determined.

Results: A mini-AQLQ cut-point of 4.7 was most significantly associated with subsequent exacerbations in patients without a history of prior acute episodes. The presence of either a mini-AQLQ score <4.7 or a history of prior acute episodes provided high sensitivity (90.4%) and identified a group nearly six times more likely to require emergency hospital care than patients with neither risk factor. The presence of both risk factors provided high specificity (79.2%) and resulted in a risk ratio of 9.5 compared with the absence of both risk factors.

Conclusion: Asthma-specific quality of life and a history of acute episodes can be used together to identify patients with clinically meaningful higher and lower risks of subsequent acute exacerbations.

From Georgia:

Albuminuria and dementia in the elderly: a community study.

Barzilay JI, Fitzpatrick AL, Luchsinger J, Yasar S, Bernick C, Jenny NS, Kuller LH. Am J Kidney Dis 2008 May 12. [Epub ahead of print]

Background: Dementia is associated with microvascular disease of the retina. In this study, we examine whether cognitive status (normal cognition, mild cognitive impairment, and dementia) is associated with albuminuria, a microvascular disorder of the kidney.

Study Design: Cross-sectional analysis.

Setting & Participants: Two thousand three hundred sixteen participants from the Cardiovascular Health Cognition Study who underwent brain magnetic resonance imaging and testing for albuminuria.

Predictor: Doubling of albuminuria.

Outcome: Dementia defined according to neuropsychological and clinical evaluation.

Measurements: Multinomial logistic modeling was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs) of dementia and mild cognitive impairment with doubling of albuminuria compared with the odds with normal cognition.

Results: Two hundred eighty-three participants (12.2%) had dementia, 344 (14.9%) had mild cognitive impairment, and 1689 (72.9%) had normal cognition. Compared with participants with normal cognition, doubling of albuminuria was associated with increased odds of dementia (OR, 1.22; 95% CI, 1.15 to 1.29). Adjustment for prevalent cardiovascular disease and cardiovascular risk factors, lipid levels, C-reactive protein level, estimated glomerular filtration rate, and apolipoprotein E-4 genotype attenuated this association, but it remained statistically significant (OR, 1.12; 95% CI, 1.03 to 1.22). Mild cognitive impairment was associated with albuminuria on unadjusted analysis, but not with adjustment for other factors.

Limitations: Results are cross-sectional; causality cannot be imputed.

Conclusions: The odds of dementia increased in the presence of albuminuria. These findings suggest a role of shared susceptibility for microvascular disease in the brain and kidney in older adults.

From Northern California:

Substance abuse treatment linked with prenatal visits improves perinatal outcomes: a new standard.

Goler NC, Armstrong MA, Taillac CJ, Osejo VM. J Perinatol 2008 Jun 26. [Epub ahead of print]

Objective: To evaluate the impact of Early Start, an obstetric clinic-based prenatal substance abuse treatment program, on perinatal outcomes.

Study Design: Subjects were 49,985 women who completed Prenatal Substance Abuse Screening Questionnaires at obstetric clinics between 1 January 1999 and 30 June 2003, had urine toxicology screening tests and either live births or intrauterine fetal demises (IUFDs). Four groups were compared: women screened/assessed positive and treated by Early Start ('SAT', n = 2073); women screened/

assessed positive without treatment ('SA', n = 1203); women screened positive only ('S', n = 156); controls who screened negative (n = 46,553). Ten neonatal and maternal outcomes were studied.

Result: SAT women had either similar or slightly higher rates than the control women on most outcomes but significantly lower rates than S women. SA women generally had intermediate rates to the SAT and S groups. In multivariate analysis, the S group had significantly worse outcomes than the SAT group: preterm delivery (odds ratio (OR) = 2.1, 1.3 to 3.2), placental abruption (OR = 6.8, 3.0 to 15.5) and IUFD (OR = 16.2, 6.0 to 43.8).

Conclusion: Substance abuse treatment integrated with prenatal visits was associated with a positive effect on maternal and newborn health.

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From the Northwest:

The greatest challenges reported by long-term colorectal cancer survivors with stomas.

McMullen CK, Hornbrook MC, Grant M, Baldwin CM, Wendel CS, Mohler MJ, Altschuler A, Ramirez M, Krouse RS. J Support Oncol 2008 Apr;6(4):175-82.

This paper presents a qualitative analysis of the greatest challenges reported by long-term colorectal cancer survivors with ostomies. Surveys that included an open-ended question about challenges of living with an ostomy were administered at three Kaiser Permanente regions: Northern California, Northwest, and Hawaii. The study was coordinated at the Southern Arizona Veterans Affairs Health Care System in Tucson. The City of Hope Quality of Life Model for Ostomy Patients provided a framework for the study's design, measures, data collection, and data analysis. The study's findings may be generalized broadly to community settings across the US. Results replicate those of previous research among veterans, California members of the United Ostomy Association, Koreans with ostomies, and colorectal cancer survivors with ostomies residing in the United Kingdom. The greatest challenges reported by 178 colorectal cancer survivors with ostomies confirmed the Institute of Medicine's findings that survivorship is a distinct, chronic phase of cancer care and that cancer's effects are broad and pervasive. The challenges reported by study participants should inform the design, testing and integration of targeted education, early interventions, and ongoing support services for colorectal cancer patients with ostomies. ❖

This article was published in Journal of Supportive Oncology 2008 Apr;6(4). McMullen CK, Hornbrook MC, Grant M, Baldwin CM, Wendel CS, Mohler MJ, Altschuler A, Ramirez M, Krouse RS. The greatest challenges reported by long-term colorectal cancer survivors with stomas. p 175-82.

The Third Responsibility

The medical profession has a responsibility not only for the cure of the sick and for the prevention of disease but for the advancement of knowledge upon which both depend. This third responsibility can only be met by investigation and experiment.

— *Proceedings of the Royal Society of Medicine, Robert A McCance, 1898-1993, physician, nutritionist, former Professor of Experimental Medicine at Cambridge University, and research pioneer in mineral metabolism*

14th Annual HMO Research Network Conference

Abstracts from the HMO Research Network

With this issue we include abstracts from the 2008 14th Annual HMO Research Network Conference, held in Minneapolis, MN, that focused on "Partnerships in Translation: Advancing Research and Clinical Care."

From Henry Ford Health System; University Hospitals of Cleveland and Case Comprehensive Cancer Center; Case Western Reserve University; Virginia Commonwealth University School of Medicine

The content of physician-patient discussions during routine health maintenance exams

Lafata JE, Cooper G, Divine G, Flocke S, Siminoff L, Stange K, Wunderlich, T.

Background: Little is known about the content of routine health maintenance exams (HMEs) delivered by primary care physicians (PCP) in today's busy primary care practices. We describe the frequency of patient-physician cancer screening discussions amidst the competing demands of other preventive services during routine HMEs to understand HME content in the real world of primary care.

Methods: We use direct observation of PCP-patient interactions during HMEs to examine discussions around breast, colorectal (CRC), cervical, lung, and prostate cancer screening and other lifestyle topics. Visits represent the first 103 visits completed in an NIH-funded study using in-office observations, audio-recordings, and patient surveys to study CRC screening recommendations. Physician participants (n = 34) are general internists or family physicians practicing in a large integrated delivery system in southeast Michigan with patient-specific electronic medical record prompts for evidence-based cancer screening. Patient participants were aged 50 to 80 years who scheduled an HME with a participating physician and were due for CRC screening (ie, no colonoscopy or barium enema within ten years, flexible sigmoidoscopy within five years or fecal occult blood testing (FOBT) within 12 months).

Results: CRC screening was mentioned in 96% of observed HMEs. Among visits by women (n = 74), 85% mentioned breast and 51% cervical cancer screening. Among visits by men (n = 29), 72% mentioned prostate cancer screening. Lung cancer screening was mentioned in 15% of visits. The physician initiated these discussions more than 80% of the time, with the exception of lung cancer screening (53%). Colonoscopy was overwhelmingly the procedure recommended for CRC screening (82%), followed by FOBT (37%) and others (4%). Other topics frequently discussed were exercise (88%), cholesterol (81%), smoking (68%), blood pressure (65%), and diet (65%). Although these discussions were usually initiated by physicians, patients were relatively more likely to initiate discussions around weight (41%) and diet (35%).

Conclusions: In this study of patients due for CRC screening, discussions did occur and specific recommendations frequently were made for CRC screening. Other cancer screening and preventive issues were discussed, but less frequently. PCPs are uniquely positioned to impact the delivery of these preventive measures and seem to be successfully striving to meet guidelines, particularly those for CRC screening.

From the Center for Health Research; Arizona State University; Southern Arizona Veterans Administration Health Care System; City of Hope Medical Center; Kaiser Permanente Northern California; and Kaiser Permanente Northwest.

Fatigue and sleep quality of persons with ostomies: gender differences

Hornbrook MC, Baldwin CM, Wendel C, Grant M, Herrinton L, Mohler J, McMullen C, Krouse RS.

Background: Some colorectal cancer (CRC) patients require a permanent ostomy (a surgically created opening on the exterior of the abdomen that allows feces to be eliminated from the body). An ostomy can create psychosocial distress and affect body image, sense of self, and sexual functioning. Few studies have examined health-related quality of life (HR-QOL) relevant to disturbed sleep of CRC survivors with ostomies; moreover, no studies have examined gender differences of ostomates on quality of sleep and fatigue.

Methods: HR-QOL was examined in this cross-sectional study of long-term (>5 years) CRC survivors with ostomies, who receive care at Kaiser Permanente health systems in California, Oregon, Washington, and Hawaii. Participants completed the City of Hope QOL Ostomy questionnaire, which includes demographic and scaled items and narrative comments for greatest challenges associated with having an ostomy. Two items, "fatigue" and "sleep disruption" (scale from 1 to 10), served as dependent variables. Age, ethnicity, education, partnered status, body mass index (BMI), and time since surgery were included in models. Data were analyzed using t-tests and ordinal logistic regression modeling with significance set at $p < 0.05$.

Results: Women (n = 118) compared to men (n = 168) were less likely to be partnered (25% vs 55%, p < 0.0001). There were no differences for age, ethnicity, education, BMI, or time since surgery. Regression modeling for fatigue showed women to have lower HR-QOL compared with men (0.65 decrease, p < 0.01), adjusted for time since surgery (modest positive association, p < 0.05). Regression modeling for sleep disruption also showed women to have poorer HR-QOL (0.57 decrease, p < 0.01), adjusted for age (modest positive association, p < 0.001). CRC surgical controls without ostomy showed no significant gender difference for either HR-QOL item. Qualitative narrative comments suggest sleep disruption is associated with fear or actual leakage during hours of sleep.

Conclusion: Women CRC survivors with ostomies report more fatigue and sleep disruption that may contribute to poorer HR-QOL compared to their male counterparts. Higher rates of fatigue for women are consistent with gender differences in other health conditions. These findings can provide a foundation for gender-specific ostomy interventions to improve sleep quality.

From Kaiser Permanente Colorado

Patient-centered communication research in integrated delivery systems

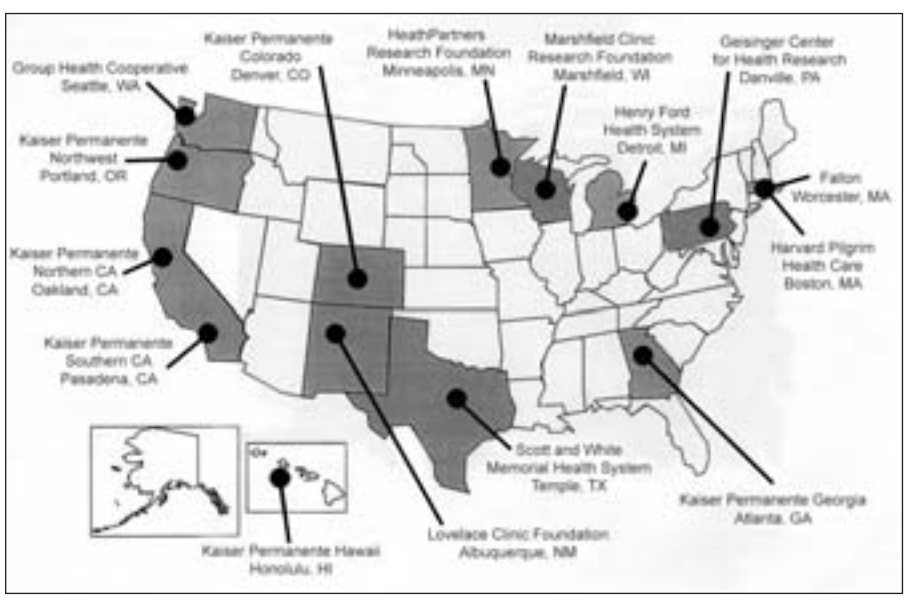
Dearing JW.

Background: Considerable differences exist between the ways in which communication is conceptualized in the academic field of communication studies, on the one hand, and in clinical practice, on the other. Theorists in the field of communication studies have conceptualized communication as 1) mutual and interactive, 2) concerning the establishment of shared meaning, and 3) dyadic in terms of physician-patient consultation.

Methods: A literature-based theoretical review focusing on the academic field of communication studies.

Results: Loosely coupled organizational systems can excel at locale-specific innovation while failing at horizontal coordination and organizational learning. Bureaucratic tendencies of complex organizations are inherently dehumanizing. In integrated health care delivery systems, attaining and maintaining a state of patient-centeredness will require continual vigilance.

Conclusions: Patient-centered communication extends beyond the context of physician-patient interaction to include provider-to-provider communication, health care team coordination, applications of electronic medical records, intraorganizational issues of continuity of care, and interorganizational issues of patient-centered communication policy dissemination. A research agenda about patient-centered communication for integrated delivery system researcher is proposed as a means for systematically improving patient-centered communication.



From the Kaiser Permanente Northwest Center for Health Research

Three-year weight change in diabetes, associated factors, and glycemic control using electronic records

Feldstein AC, Nichols GA, Smith DH, Stevens VJ, Bachman K, Rosales AG, Perrin N.

Background/Aims: The importance of weight loss in diabetes mellitus type 2 (DM) is undisputed. Limited community data describe weight change in DM and resulting glycemic and blood pressure control.

Methods: Using electronic medical records, this retrospective cohort study identified patients aged 21-75 years with new DM diagnosed between 1/1/1997 and 12/31/2002. Eligible patients met weight measurement criteria and did not have a condition associated with unintentional weight change (n = 2574). We estimated three-year patient weight trajectories using growth curve analyses, grouped similar trajectories using cluster analysis, compared their characteristics, and used weight trajectory patterns to predict year-four above-goal glycosylated hemoglobin (HbA_{1c}) and blood pressure.

Results: The four weight trajectory groups were "higher stable weight" (n = 418; 16.2%), "lower stable weight" (n = 1542; 59.9%), "weight gain" (n = 300; 11.7%), and "weight loss" (n = 314; 12.2%). Weight losers began regaining weight at about 18 months and by three years were nearly the same mean weight as weight gainers. When compared to gainers, a weight loss pattern was associated with baseline older age,

higher income, more frequent obesity, and lower levels of above-goal HbA_{1c} and blood pressure. After adjusting for age, gender, baseline values, and related medication use, those with higher stable or weight gain patterns were more likely to have above-goal HbA_{1c} and blood pressure than losers.

Conclusion: A three-year weight loss pattern after a new diagnosis of DM improved glycemic and blood pressure control in year four despite weight regain. The initial period after diagnosis of diabetes may be a critical time to apply weight loss treatments to improve longer-term risk factor control.

From Kaiser Permanente Southern California

Activities and cognitive functioning in very elderly women

Crooks VC, Chiu V, Little DM.

Background: Although not uniformly positive, several studies have suggested that leisure and social activities are associated with higher cognitive functioning in older adults.

Methods: This cross-sectional study examined the influence of social activities on the cognitive functioning of 1436 women who were aged 80 years or older from a health maintenance organization in Southern California. Cognitive functioning was assessed using the Telephone Interview for Cognitive Status modified (TICSm). Ten questions measured which social and leisure activities women participated in in the past few months. Major medical conditions and Instrumental Activities of Daily Living (IADL) were also assessed.

Results: Except for watching television and doing paid volunteer work, all of the TICSm mean scores were higher for women who participated in the other eight activities. When comparing those who scored in the lower versus the higher cognitive functioning groups (ie, <28 score on TICSm), those engaged in hobbies, shopping, movies, crossword puzzles, trips, and unpaid volunteer work had much higher proportions of participants scoring in the higher cognitive group. Those who reported needing help in IADL were less likely to participate in activities and scored lower on TICSm (*t*-test: all $p < 0.001$). Older women and those with less education had a reduced likelihood of participating in activities. After adjusting for age, education, medical conditions and IADL, only four activities were significantly and inversely related to lower cognitive scores ($p < 0.05$). Odds ratios (95% confidence interval [CI]) were as follows: having a hobby, 0.73 (CI 0.57, 0.94); going on a day or overnight trip, 0.58 (CI 0.46, 0.75); doing unpaid volunteer work, 0.69 (CI 0.52, 0.92); and doing crossword puzzles, 0.51 (CI 0.39, 0.67).

Conclusions: These results suggest that some social and leisure activities may help promote cognitive health. ❖

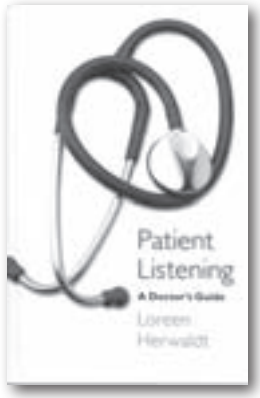
Invariably The Same

The method of research, however, of positing the questions and solving the questions posited, is invariably the same, whether we have before us a blooming rose, a diseased grape-vine, a shining beetle, the spleen of a leopard, a bird's feather, the intestines of a pig, the brain of a poet or a philosopher, a sick poodle, or an hysterical princess.

— Christian Albert Theodor Billroth, 1829-1894, German-Austrian surgeon and amateur musician, often considered the father of modern abdominal surgery

BOOK REVIEW

Patient Listening: A Doctor's Guide
by Loreen Herwaldt



Iowa City (IA): University of Iowa Press, 2008. ISBN-10: 1-58729-652-7. ISBN-13: 978-1-58729-652-9. Softcover: 174 p. $24.95.

Review by Vincent J Felitti, MD, FACP

That this is an unusual book is immediately suggested by the triple entendre of its title. That it is clinically useful and interesting requires dipping into the text, which is largely rendered in the cadence and typographic layout of poetry. This turns out to be a surprisingly helpful device, perhaps because it slows us down enough to improve our understanding—the way work songs once organized and improved effort by creating a sense of relationship. After all, poetry is a highly efficient way of transferring understanding from the unconscious of one person to that of another, using rhythm, rhyme, and allusion—usually bypassing conscious resistance when well done.

Loreen Herwaldt, MD, is an internist who is deeply engaged in trying to improve medical practice through what has become known as Narrative Medicine. Although the medical history is clearly the most important component of our diagnostic triad of history, physical examination, and laboratory studies, we all know it is often given short shrift because of time, inexperience, and discomfort. Narrative Medicine is that process, even involving the world-famous Writer's Workshop at the University of Iowa, that supports eliciting and understanding a patient's history. It is this variation on a basic theme that, in addition to understanding our patients to be more than bearers of a disease, lets us see our own feelings, unexpectedly, quickly, and without too much pain.

The patients whose stories are abbreviated and reformatted in this book are a diverse group including some famous physicians writing of their own personal experiences with disease and treatment. Interestingly, the physicians are often critical of the frequent lack of humanity in the care they received. It is not a happy picture they paint of being on the receiving end of medical practice, but they make this clear in a way that is somehow acceptable. Unexpectedly, I even learned some interesting biomedical information about retinal detachment and intermittent intestinal obstruction. The vivid descriptions elicited by the process of this book made that learning far more memorable and gratifying than reading it in medical texts.

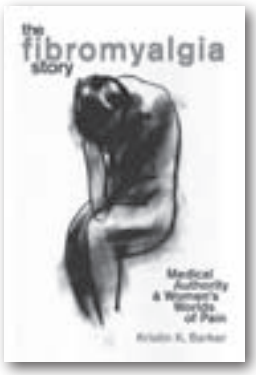
Narrative Medicine turns out to be code for relationships, the often-missing piece that underlies so much physician unhappiness. Don't look away. Get this book. ❖

Vincent J Felitti, MD, FACP, is an Internist in the Department of Preventive Medicine at the Clairemont Mesa Medical Office in San Diego, CA. He is a Clinical Professor of Medicine at the University of California, San Diego. He is also an Expert Reviewer for the Medical Board of California. E-mail: vjfmdsdca@mac.com

Listening

Listening is a magnetic and strange thing, a creative force.
The friends who listen to us are the ones we move toward.
When we are listened to, it creates us, makes us unfold and expand.

— Karl A Menninger, 1893-1990, American psychiatrist and founder of the Menninger Foundation and Menninger Clinic



Philadelphia (PA): Temple University Press, 2005.

ISBN-13: 978-1592131617; ISBN-10: 1592131611. Paperback: 252 p. $22.95.

The Fibromyalgia Story: Medical Authority & Women´s Worlds of Pain

by Kristin K Barker

Review by Anna Luise Kirkengen, MD, PhD

The sociologist, Kristin K Barker, scrutinizes the medical making of a disease: fibromyalgia syndrome (FMS)—a disease of painfulness, predominantly in women. She outlines the following: In the beginning is the story of the pain named "fibrositis." After much research, this story ends with the dismantling of the misnomer: no inflamed fibers can be demonstrated to justify the diagnostic term.

Next comes the story of the tender trigger points—painful areas mapped on the body and "objectified" by means of a pain response to a certain thumb pressure exercised by the physician in a systematic way. Description of a pain experience is subjective and thus invalid. The response to a grip evoking pain, however, is considered objective, and therefore valid.

Despite the fact—and general acknowledgment—that pain is a subjective phenomenon, thumb pressure gains instrumental status for "transforming" a reported pain into a proven pain, rendering the pain an objective entity that can be dealt with as if not subjective (though it is). Thus, it is real. *Real* pain is proof of a *real* disease, defined as in the realm of rheumatology, although no inflammatory or autoimmune origin of the pain has been demonstrated.

In a critical analytical reading, the making of FMS is grounded in this scientific flaw, a fact that remains unacknowledged by the research community. Instead, the localization of the tender points, and the number of points needed to establish the diagnosis FMS, soon become central topics in a heated debate.

By 1990, the American College of Rheumatology (ACR) had to admit that FMS is to be considered an ill-defined diagnosis, at best. Barker delineates consistently why a large trial initiated and controlled by ACR can only be characterized as nonscientific: it rests on the flaw of the tender points; they both define and substantiate the "diagnosis." Thus, all studies represent tautologies.

The amount of pain "out there" is so huge that it represents an appeal to what Barker calls "medical entrepreneurship." Within the next decade, a stunning increase of FMS publications was observed. Between two dominating and polarized camps defining the condition as organic and psychogenic/behavioral, respectively, there are the "bridge-builders" of psychosomatics, and the advocates of a "bio-psycho-social" model.

By 2000, the uncomfortable question arising from a considerable body of nonconclusive research is: How is medicine to understand that, in a huge number of individuals, *all* perceptions translate into pain and *every* pain perception is exaggerated? Barker proposes two possible answers: "We do not know at all," and "Our methods are not adequate."

However, research continues "as usual," documenting an "overlap" with a variety of other diagnoses—so-called comorbidities. People "in pain" are obviously also otherwise "in trouble." The two main camps sophisticate their profile by focusing on complexities: a dysregulation spectrum syndrome versus affective spectrum syndrome.

It becomes ever more obvious that FMS research is no success story and investigations decline dramatically. Although a rheumatologic disease by definition, and by far the most common of disorders seen by rheumatologists, by 2005 fewer than 1% of specialist studies were on FMS.

Without comment from the side of the specialists, FMS has shown to be a predominantly female complaint. Although only a minority of publications explicitly addresses gender, most studies document a significant gender asymmetry. In addition to the conceptual flaws, the research community dismantles itself as highly gender-biased. FMS is inscribed by scientific measures into a long history of feminization of diseases from hysteria to neurasthenia to chronic fatigue and to chronic pain.

This methodological concealment of the gender bias in FMS-research is anchored in the biologic body, a body void of meaning and experience. Expressions of women's distress are not seen and explored in a sociocultural context but biologized and medicalized. The colonization of female bodies by biomedicine has found a new realm.

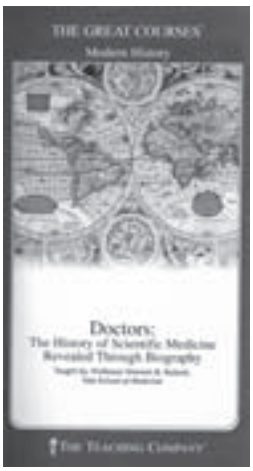
Barker refers to phenomenologists, anthropologists, and sociologists who urge biomedicine to broaden its theoretic framework and methodologic repertoire. She advocates that medicine transcend its horizon from the biologic body to the body as embodied life. In doing so, clinicians and physicians will enable themselves to make meaning out of their patients' lived experiences, and perhaps their own.

This is a really good book about why biomedicine is not good enough when judged according to its most noble mandate: to alleviate human suffering. ❖

Anna Luise Kirkengen, MD, PhD, is a former Family Practice physician in Oslo, Norway. She now lectures on the topic of how abused children become sick adults. She also tutors students in health care professions. E-mail: anlui-k@online.no.

Doctors: The History of Scientific Medicine Revealed Through Biography

by Sherwin Nuland, MD



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Review by Vincent J Felitti, MD, FACP

Those readers not yet familiar with The Teaching Company might wish to become familiar with their Web site at www.TEACH12.com. This publisher focuses on identifying teachers with unusual skill, recording their lectures, and making them widely available in DVD and audio formats. The subjects range from art and music to literature, science, mathematics, and medicine.

Doctors is a series of twelve half-hour lectures by the Yale surgeon-author, Sherwin Nuland, MD, who is perhaps best known for his best seller, "How We Die." Dr Nuland is also an engaging speaker, here on the history of medicine. At some point in our professional lives, many of us start to wonder how what we know and do originally came into being. This DVD set is as interesting a way to explore the developmental history of our profession as one might imagine.

Doctors starts with Hippocrates and a discussion of his contributions to medicine, which were both clinical-philosophical and ethical. It progresses smoothly and engagingly through a number of major figures to Morgagni, the physician anatomist from Padua, Italy, who, in the 1700s, created a paradigm shift in medical practice by moving us from philosophic explanations of disease (imbalances in the four Humors) to evidence-based explanations. Dr Nuland's discussion of Morgagni's 1705 description of the autopsy findings of a ruptured appendix is absolutely fascinating; in addition to being clinically vivid, it illustrates how the Psoas Sign came to be used in the diagnosis of appendicitis. Morgagni was a key figure in developing our modern concepts of organ-based disease, an idea that we now take for granted, having forgotten the not-too-distant concept of humoral imbalances. His statement, "Symptoms are the cries of the suffering organs," poses the question, "In what organ is the disease?" His clinical work, only about 300 years ago, was the beginning of detailed physical examination as a way of identifying organ pathology before autopsy.

The 12th and closing biography is the story of the hearing-impaired pediatric cardiologist, Helen Taussig, who developed precordial diagnostic palpation to a high level to compensate for her problems in auscultation. The description of how she conceived the "blue-baby" operation for Tetralogy of Fallot, and then convinced Alfred Blalock and his remarkable surgical technician, Vivien Thomas, to carry it out is the best telling I have heard of this modern medical drama.

The engaging content of *Doctors,* and the fact that The Teaching Company offers a money-back guarantee of satisfaction on its products, makes it of special interest. This and other products from The Teaching Company are often on sale at markedly reduced prices, so it is worth being on their mailing list. ❖

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— Ralph Waldo Emerson, 1803-1882, American essayist, philosopher, poet, and leader of the Transcendentalist movement in the early 19th Century

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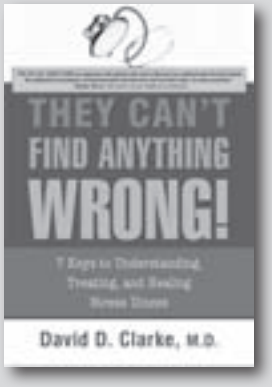

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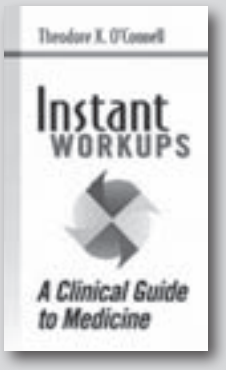

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