Published in final edited form as:

Med Care Res Rev. 2011 December ; 68(6): 650–666. doi:10.1177/1077558711409047.

Differences Between Internists and Family Practitioners in the Diagnosis and Management of the Same Patient with Coronary Heart Disease

Rebecca Shackelton-Piccolo, Sc.M.¹, John B McKinlay, Ph.D., FACE ¹, Lisa D Marceau, MPH¹, H. Goroll Allan, MD³, and Carol L Link, Ph.D.¹

¹ New England Research Institutes, Inc., Watertown, MA, USA

³ Massachusetts General Hospital, Boston, MA, USA

Abstract

It has been suggested that internists and family practitioners have somewhat different “disease” perspectives, which may be generated by use of different explanatory models during medical training (pathophysiological vs. biopsychosocial, respectively). This paper explores differences between internists and family practitioners in their suggested diagnoses, level of diagnostic certainty, test and prescription ordering, when encountering exactly the same “patient” with coronary heart disease (CHD). Internists were more certain of a CHD diagnosis than family practitioners and were more likely to act on this diagnosis. Family practitioners were more likely to diagnose (and were more certain of) a mental health condition. While many physicians simultaneously entertain several alternate diagnoses, diagnostic certainty has shown to have an important influence on subsequent clinical actions such as stress testing and prescription of beta blockers. These results may inform future educational strategies designed to reduce diagnostic uncertainty in the face of life-threatening conditions, like CHD.

Keywords

primary care; disease models; coronary heart disease

INTRODUCTION

Variations in the processes and quality of medical care in the United States have been extensively documented and are a major concern for health services researchers and policy experts (Institute of Medicine, 2003). Research to date has ranged from describing area variations between national health care systems and geographic regions (McKinlay et al., 2006), to differences between practice settings and organizational cultures, (Shackelton, Link, Marceau, & McKinlay, 2009), to the often more subtle influence of patient attributes, (i.e. between race/ethnic groups and by gender, age and socio-economic status) (Arber et al., 2004; Institute of Medicine, 2003; McKinlay et al., 1997). Some studies have focused on the influence of physician characteristics, such as gender, age/clinical experience and medical specialty (Burns et al., 1997; McKinlay, Lin, Freund, & Moskowitz, 2002). Differences between medical specialties in the diagnosis and management of illness conditions have been reported and are commonly attributed to differences in treatment philosophy, training, and personality type (Greenfield, Nelson, & Zubkoff, 1992). That variations may also occur within a medical specialty, for example between general internists and family practitioners

within primary care, has received little attention. What occurs at the level of primary care is important for several reasons; a) it is the gateway to the healthcare system, crucially determining the course of many diseases, costs and patient outcomes; b) it is where the vast majority of illness in society is presented and cared for; c) it may be the point of origin for the generation and amplification of many reported disease disparities; (McKinlay et al., 2007; McKinlay, Potter, & Feldman, 1996) and d) it may also be the point of origin for ever increasing costs of health care, given the suggestion that the most expensive piece of medical technology may be a physicians' pen (Gawande, 2009; Noren, Frazier, Althman, & DeLozier, 1980).

Differences in clinical practice between general internists and family practitioners may begin during medical residency. Internal medicine residency training is largely based in the inpatient setting (Holmboe et al., 2005; Weinberger, Smith, & Collier, 2006). Internal medicine residents spend about 10 percent of their training time in ambulatory settings, whereas family practice residents spend about 30 percent in such settings (Cherkin, Rosenblatt, Hart, Schneeweiss, & LoGerfo, 1987). Family practice training programs devote considerably more attention and time to psychosocial issues (Gaufberg et al., 2001). Gaufberg and colleagues suggest family practice and internal medicine have distinct perspectives, employing different explanatory models of "disease"—family practice is grounded in a biopsychosocial framework whereas internal medicine appears more pathophysiologically (biomedically and subspecialty) oriented (Gaufberg et al., 2001).

Differences between internists and family practitioners have received little attention, despite their importance for understanding variations in diagnostic accuracy and certainty, costs, the quality of health care and patient outcomes. Internists reportedly perform more detailed physical examinations and order more laboratory tests which contributes to-increasing health care costs, although it has been suggested internists may also encounter sicker patients with more complicated medical problems (Conry, Pace, & Main, 1991; Kravitz et al., 1992). Family practitioners appear to ask more questions concerning a patient's emotional status and life situation (Cherkin et al., 1987; Noren et al., 1980; Smith & McWhinney, 1975).

This paper examines differences between internists and family practitioners in their diagnosis and management of exactly the same "patient" presenting with the signs and symptoms strongly suggesting coronary heart disease (CHD). We attempt to avoid methodologic limitations of work to date on medical specialty differences related to differences in medical setting, types of patients, case mix, resources, and health care system (Kravitz et al., 1992). While some differences in practice style and resource utilization between internists and family practitioners have been examined, possible differences in diagnostic preferences and processes of care between these two groups have received little attention.

We employ data from a random sample of community-based primary care physicians (PCPs) to addresses the following questions: First, are there any differences between internists and family practitioners in their suggested diagnoses and level of diagnostic certainty when encountering exactly the same "patient"? Second, are there any noteworthy differences in the processes of care between internists and family practitioners, particularly with regards to testing and prescriptions? These questions have important implications for reported disparities in disease rates, health care variations, the increasing costs of health care and even patient outcomes.

New Contributions

Most research to date on differential PCP decision making has been plagued by confounding, since internists may see sicker patients and are thought to encounter more complicated medical problems (Kravitz et al., 1992). In our study all primary care physicians saw a “patient” with exactly the same signs and symptoms, thereby completely eliminating confounding due to the severity of illness. There may also be differences by gender and age/clinical experience, which may affect the interpretation of any differences between internists and family practitioners. Our research design permitted us to control for any such differences. Further, many prior studies were performed at single sites, whereas our study utilized a random sample of physicians from different geographic locations.

Conceptual Framework

Gaufberg and colleagues suggest family practice and internal medicine have distinct perspectives, emphasizing different explanatory models of “disease”—family practice is grounded in a biopsychosocial framework whereas internal medicine is more pathophysiologically (biomedically and subspecialty) oriented (Gaufberg et al., 2001). These conceptual differences are manifested in residency training as discussed above. Differences in training may also contribute to differing diagnostic practices and reactions to clinical uncertainty. The question is: do these suggested differences in the training and perspective of internists and family practitioners eventually manifest themselves in differences in diagnosis, clinical uncertainty and processes of care relating to clinical management?

METHODS

We conducted two factorial experiments using clinically authentic filmed vignettes. Study 1 was conducted from 2001–2002, while Study 2 was conducted from 2006 – 2007. Each filmed vignette presented exactly the same essential diagnostic signs and symptoms of CHD, including chest pain worsening with exertion, pain in the back between the shoulder blades, stress, and elevated blood pressure (Table 1). This condition (CHD) was selected because: a) it is among the most common and costly problems presented by older patients to primary care providers; (Cohen & Krauss, 2003); b) it represents an example of a well-defined organic medical condition; c) it triggers a wide range of diagnostic, therapeutic and lifestyle actions; and d) it is an extensively studied condition in which variations in diagnostic and treatment decisions have been repeatedly demonstrated. Our research methods have been reported elsewhere (Lutfey & McKinlay, 2009; McKinlay et al., 2006) and are briefly summarized below.

Experimental Stimuli (The Clinical Vignette)

One version of the vignette, varying by age (55 vs. 75), gender, race (black vs. white) and socioeconomic status (SES) (lower vs. higher, depicted by current or former employment as a janitor or school teacher) was shown to each of the physicians (n= 384) recruited as subjects for the experiment. The script was developed from several tape-recorded role-playing sessions with experienced clinical advisors. Since consultants to our studies advised that real patients do not typically present as clear-cut textbook cases of specific conditions, several red herring symptoms were deliberately embedded, as commonly occur in everyday practice. To this end, the patient also complained of indigestion, feeling worse after a large or spicy meal, having pain similar to heartburn but unresponsive to antacids, and feeling full and “gassy.” This was done not to make the physicians’ diagnostic task more difficult, but to ensure greater clinical authenticity. Professional actors were selected for their comparability in appearance and trained under experienced physician supervision to realistically and

consistently portray a patient presenting with these signs/symptoms to a primary care provider.

Experimental Subjects (Physicians)

To be eligible for selection, physicians had to: (a) be internists, family, or general practitioners with M.D. degrees (international medical graduates were included in the second study); (b) have ≤ 12 years clinical experience or ≥ 22 years experience in order to obtain clear separation between higher and lower levels of experience and so we could stratify physicians accordingly; and (c) be currently working in primary care more than half-time. The sampling frame was derived from lists of primary care physicians practicing in New York, New Jersey, Pennsylvania, and North and South Carolina and purchased from the Medical Marketing Survey (MMS) group which manages the American Medical Association (AMA) Physicians Professional Data. (Medical Marketing Survey, 2001) Lists were stratified into four groups: less experienced males, less experienced females, more experienced males, and more experienced females. Physicians were then randomly sampled from these lists. Physician recruitment was random with regard to practice location, practice type, and the type of healthcare setting in which a provider worked. A letter of introduction was mailed to prospective participants and screening telephone calls were conducted to identify eligible physicians. An appointment was scheduled with each eligible participant for a one-on-one, structured interview, lasting one hour.

384 interviews were conducted in Massachusetts (Study 1, $n=128$) and North and South Carolina (Study 2, $n=256$). The overall response rate was 38.5%. Physicians were drawn from throughout three states, with the 384 physicians practicing in over 100 different cities. There were only eight cities with five or more participants: Boston, Newton, Brookline, and Lexington, Massachusetts, Charlotte, Durham, and Raleigh, North Carolina, and Charleston, South Carolina. IRB approval for the studies was obtained and signed informed consents were collected from each participating physician.

Measures

Diagnosis and Certainty—After viewing the filmed vignette, physicians were asked, “We recognize that you might be considering several possible diagnoses for this patient. Which do you think is the most likely condition?” and to list additional candidate diagnoses they were considering as part of their differential. For each diagnostic possibility participants were asked to assign a number indicating their level of certainty on a scale of 0–100, with 0 indicating no certainty and 100 indicating complete certainty. They were also asked a series of structured interview questions regarding how they would treat the patient (i.e., additional information they would request, physical examinations they would perform, tests they would order, medications they would prescribe, lifestyle advice they would provide, and any referrals they might initiate). These questions were open-ended; responses were recorded verbatim and coded in-house after the interview was completed. This coding was completed using a consensus model. A coding rubric was created based on the responses to a pilot study and through extensive consultation with two clinical colleagues. After each interview the research assistant who conducted the interview applied the coding rubric to the physician’s responses and reviewed the coding decisions with the principal investigator. Responses for which the appropriate code remained unclear were reviewed by our clinical consultants.

Clinical Management—Checking four major textbooks in primary care, two from internal medicine (Goroll, 2009; McPhee & Papadakis, 2009) and two from family practice (Rakel, 2007; Taylor, 2003) we developed a list of diagnostic testing (ECG/EKG, stress test) and treatment actions (prescription of nitrates, aspirin, beta blockers) recommended for a

patient presenting with the signs and symptoms depicted in the vignette. Our textbook review, along with a review of current clinical guidelines and advice from our clinical consultants revealed no major differences in diagnostic testing or treatment actions recommended for a patient presenting with the signs and symptoms depicted in our vignette.

Covariates—Our physician subjects also completed a self-administered survey pertaining to their backgrounds, features of their practice, time pressures and perceptions of care.

Analytic Strategy

Analysis of variance was used to test the main effects and two-way interactions of the design variables (patient gender, race, age, and SES; physician gender and level of experience) and primary care specialty (family practitioner or internist) on the outcomes of interest (listed above). Due to the large number of comparisons, there are potential problems with multiple testing. Recognizing this issue we used multivariate analysis of variance (MANOVA) on all outcomes to (1) evaluate the overall effect of the primary variable of interest, primary care specialty, (2) to allow us to simultaneously evaluate multiple outcomes, and (3) to evaluate any interactions between primary care specialty and the design variables. For ease of presentation, bivariate data analyses were conducted using t-tests for continuous variables and chi-square or Fisher's exact test for categorical variables. All analyses were conducted using SAS 9.2 (Cary, NC).

RESULTS

There were 192 self-defined family practitioners (50.0%) and 175 internists (45.6%) in our sample of 384 PCPs. General practitioners (n=17, 4.4%) were removed from the following analyses. Internists were similar to family practitioners in gender (Table 2). Internists were slightly more experienced (56.0% had ≥ 22 years experience) than family practitioners (42.7% had ≥ 22 years experience, $p = 0.01$). Internists were more likely to be practicing in a large group primary care practice (13.7% vs. 4.7% of family practitioners, $p=0.003$). We did not expect patient characteristics to vary by physician specialty since vignettes were randomly assigned to physicians within a gender/experience strata (race, $p = 0.65$; gender, $p = 0.22$; SES, $p=0.96$; age, $p = 0.38$).

Diagnosis and Certainty

Physicians were asked to list potential diagnoses as part of a differential. CHD, gastrointestinal (GI) illness, and mental health diagnoses were by far the most common diagnoses considered. Nearly all internists and family practitioners included CHD and GI illness in their list of possible diagnoses (97%, Figure 1), but internists were more certain about a CHD diagnosis (60.9 on a scale of 0–100 with 100 being the most certain) than family practitioners (53.7, $p=0.005$). Family practitioners were more likely to diagnose a mental health issue (80.2%) than internists (65.7%, $p=0.002$) and were more certain about this diagnosis (44.7 vs. 37.2, $p = 0.03$). We further ranked diagnoses by physician certainty. Internists were more likely to rank a CHD diagnosis as their most certain diagnosis than family practitioners (55.4% vs. 38.5% respectively, $p=0.001$). Family practitioners were twice as likely to rank a mental health diagnosis as their most certain diagnosis (24.5% vs. 12.0%, $p=0.001$).

Test Ordering

Internists were more likely to order a stress test (68.0% vs. 46.9%, $p<0.001$).

Prescribing

Internists were more likely to prescribe beta blockers (28.6% vs. 17.2%, $p=0.03$) and slightly more likely to prescribe a nitrate (45.1% vs. 35.4%, $p = 0.06$). Both physician groups were equally likely to recommend aspirin therapy (40%).

Question Asking

Family practitioners asked significantly more questions (11.6 questions on average) than internists (8.5, $p<0.001$), and were slightly more likely to ask questions about smoking (68.8% vs. 59.4%). Internists were slightly more likely to ask questions about pain and triggers (54.9 vs. 45.3%, $p=0.07$).

Advice

Family practitioners gave significantly more lifestyle advice (4.2 pieces of advice on average) than internists (3.1, $p=0.003$) including advice about alcohol (25.5% vs. 14.9%, $p=0.04$).

Follow-up

There were no differences in time to next appointment between the two physician groups (both would want to see the patient again in 9–10 days). The MANOVA showed a significant overall difference between internists and family practitioners in the way they would “manage” the patient ($p < 0.0001$).

Internists report having significantly greater time to spend with patients for a variety of visit types including: new patient appointments (35.6 minutes vs. 27.1 minutes for family practitioners, $p < 0.001$), routine visits (19.2 minutes vs. 16.2, $p < 0.001$), and complete physical exams (36.1 minutes vs. 32.0, $p = 0.003$). Internists report that they need more time for patient visits as well: new patient appointments (42.1 minutes vs. 33.4, $p < 0.001$), routine visits (20.9 vs. 18.2, $p = 0.002$), and complete physical exam (41.7 minutes vs. 38.2, $p = 0.02$, Figure 2). The MANOVA showed a significant overall difference between internists and family practitioners in terms of time needed and allocated for these visit types ($p < 0.0001$).

Finally, in there was a significant difference between family practitioners and internists in their opinion about the ideal balance between the physician vs. patient as the decision-maker. On a scale from 0 to 10 with 0 meaning physicians should make all the decisions and 10 meaning patients should make all the decisions. Family practitioners believed that patients should have greater involvement in decision making (4.2 out of 10) than internists (3.5 out of 10, $p = 0.01$, Figure 3).

Unlike previous studies we found no interaction between patient age and physician specialty (Cherkin et al., 1987). Results were closely compared for measurement differences by time and region (Study 1 was conducted from 2001–2002 in MA while Study 2 was conducted 2006–2007 in NC/SC).

DISCUSSION

This paper explores differences between internists and family practitioners within the medical specialty of primary care, in the diagnosis and management of coronary heart disease (CHD). All 384 PCPs sampled for our study viewed the same clinically authentic “patient” presenting with signs and symptoms suggestive of CHD. Importantly, both internists and family practitioners listed the correct diagnosis of CHD somewhere in their list of differential diagnoses (97% for both internists and family practitioners) However, the

general internists expressed significantly greater certainty for the diagnosis, and also reported being more likely to test for and treat CHD. Family practitioners included CHD in their differential diagnosis, but were significantly more likely to rank a psychosocial cause above CHD, express more certainty with that formulation, and recommend psychosocial and behavioral interventions. These findings are consistent with those from other studies (Cherkin et al., 1987; Noren et al., 1980; Smith & McWhinney, 1975) and are likely driven by the differing levels of certainty on the primary diagnosis of CHD (Lutfey, Link, Grant, Marceau, & McKinlay, 2009).

Based on these results, we identify three sets of research implications. First, differing levels of diagnostic certainty have important implications for subsequent confirmatory actions and costs (test ordering), and medical education programs. Second, as many physicians clearly identified a potential CHD diagnosis and yet testing for a CHD diagnosis (stress test) was low, it is clear that diagnostic approaches in the face of clinical uncertainty played a role in this study. Since, diagnostic approaches between internists and family practitioners vary these differences are discussed. Third, differences manifested in this study are discussed in light of the training and socialization to a disease model in residency training.

Diagnostic Certainty

There is increasing interest in understanding the sources of physician certainty/uncertainty and its consequences for health care costs and the quality of care (Groopman, 2007). Work in medical decision-making that suggests physicians must cross “certainty thresholds” before taking clinical action and indicates that clinical certainty is more important than simply identifying a diagnosis (Pauker & Kassirer, 1980). Diagnostic certainty appears to have an independent influence on subsequent clinical actions in CHD, such as stress testing and prescription of beta blockers (Lutfey et al., 2009). Therefore, merely identifying a CHD diagnosis within a full differential diagnosis is necessary but is not necessarily sufficient to trigger clinical actions. Low levels of diagnostic certainty for CHD may, at least in part, explain low levels of stress testing and the recommendation of beta blockers. To overcome the problem of clinical inertia, future educational strategies may encourage physicians to be more proactive, even if their certainty is low, at least for potentially life-threatening conditions such as CHD.

Family practitioners demonstrated a higher level of certainty for a mental health diagnosis than internists. Reduced certainty regarding the presenting problem (CHD) may encourage family practitioners to consider and be more certain of alternative diagnoses (e.g. mental illness). However, the common and nonspecific nature of many symptoms associated with mental illnesses, and the lack of associated testing strategies, make mental illnesses difficult to rule out. Previous literature has shown that considering a mental health diagnosis with a high degree of certainty may jeopardize CHD certainty and therefore CHD treatment (Lutfey & McKinlay, 2009).

Diagnostic Strategies

Literature has begun to focus on physicians’ diagnostic information processing as an important source of variation in clinical decision making. Diagnostic processes have been described as analytical or intuitive (Crookery, 2009a). Two popular analytic methods are the “Bayesian reasoning” approach and the “exhaustion strategy” (Crookery, 2009a). Under the Bayesian approach epidemiologic prevalence data is used to inform clinical decision making and the diagnostic strategy is often hierarchical in nature (ruling out one diagnosis at a time starting with the most probable, or most certain, diagnosis) (Crookery, 2009b; Maserejian, Lutfey, & McKinlay, 2009). Under the exhaustive approach all potentially relevant diagnostic data are collected and diagnoses are treated laterally (collecting data on

and treating all potential diagnoses in an equal fashion). Each of these approaches has potential pitfalls which may explain some of the results seen in this study.

The hierarchical Bayesian method opens physicians to the single most prevalent cause of diagnostic error coined “satisfaction of search” (Groopman, 2007) or “premature closure” (Berner & Graber, 2008). This cognitive error is described as the tendency to stop searching, and testing, for a diagnosis once a diagnosis is assigned with a high probability/certainty (Groopman, 2007). Our previous work has shown that when physicians seriously entertain a mental-health diagnosis, as family practitioners in this study were more likely to do, it is less likely that a patient will receive a CHD diagnosis with enough certainty to trigger clinical testing and treatment. A mental-health diagnosis, which was disproportionately given to female patients, may be one example of “satisfaction of search” (Lutfey & McKinlay, 2009). As no definite testing strategies are available for ruling out mental-health disorders, this may lead to premature closure, or in a hierarchical Bayesian diagnostic methodology, a failure to move to the next most likely condition. These diagnostic strategies have important implications for the costs and quality of healthcare. The exhaustive approach is known has obvious implications for the ever-rising costs of health care, while the Bayesian approach has been shown to amplify existing health disparities (Maserejian et al., 2009).

A third diagnostic strategy, less commonly used in primary care, is known as the “Rule out worst-case scenario” (ROWS) strategy and is commonly used in inpatient and emergency settings (Croskerry, 2002). This strategy is hierarchical in nature, much like the Bayesian strategy, but rather than considering and eliminating diagnoses ranked by certainty, diagnoses are considered by risk or impact. Unlike a Bayesian approach which deals with the most probable illness first, the most life-threatening condition is dealt with first (in this case CHD). With respect to the observed differences in CHD certainty and CHD-related testing, internists who typically spend more training time in inpatient settings may be more exposed to CHD patients and to the ROWS diagnostic strategy, while family practitioners might have somewhat less experience with CHD patients.

Theoretical Framework: the impact of PCP training

There are often overlooked differences between the residency training for general internists vs. family practitioners. Internal medicine residents typically spend more time in inpatient settings while family medicine residents spend more time in outpatient settings (Cherkin et al., 1987) (The Accreditation Council for Graduate Medical Education, 2009). Family medicine programs devote significantly greater time to psychosocial issues (Gaufberg et al., 2001). These differences between training emphases may help to explain the observed differences in mental health certainty, question asking, and lifestyle advice. Family medicine’s psychosocial emphasis might be contributing to the compromised certainty of CHD noted in this study. Previous studies have noted that when physicians identify mental health conditions among their diagnostic possibilities it becomes more difficult for the physician to successfully route back to a CHD diagnosis with sufficient certainty to trigger diagnostic testing (e.g. a stress test) and treatment (e.g. prescribing beta blockers) (Lutfey & McKinlay, 2009).

A likely explanation for the diagnostic and management differences we observe may be the fundamentally different explanatory models of illness employed during the training of internists and family practitioners. Internists appear to have an intellectual tradition of viewing illness as the manifestation of pathophysiologic phenomena. Proper diagnosis requires detailed elicitation and analysis of symptoms, signs, and laboratory tests to deduce the underlying pathophysiology, which in turn informs accurate diagnosis and treatment. Family medicine’s emphasis on the biopsychosocial model of illness gives precedence to life stresses and psychological and behavioral factors (Taylor, 2003).

In a field as broad as primary care, concentrating too heavily on one explanatory model might compromise diagnosis. Too narrow a focus for PCPs puts them at risk for premature closure, too broad a focus increases unnecessary testing thereby contributing to ever increasing health care costs. In this study examining differences in the diagnosis and management of CHD the pathophysiologic focus of internists, along with their greater exposure to CHD patients in training, may explain many of the results of this study. Future studies on the clinical decision making of PCPs might focus on a range of conditions from the psychosocial to the physiological. On the psychosocial end of the spectrum we may expect to find a different result, with physicians too narrowly focused on the pathophysiologic missing important psychosocial contributions.

Strengths and Limitations

The research described here has both strengths and limitations. Concerning its strengths, rather than studying PCPs conveniently available from, say, a large hospital or medical center, we obtained a large sample of physicians working in different practice settings from different geographic areas. All 367 physicians (175 internists and 192 family practitioners) encountered exactly the same “patient”. Furthermore, by randomly assigning physicians to a specific combination of patient characteristics in a given vignette we move beyond the limitations of previous studies comparing physician specialty within primary care which were limited by the inherent differences in the patient populations seen by internists and family practitioners.(Kravitz et al., 1992)

Research on physician decision making tends to focus on prescribing and test ordering behavior. The present study includes a much broader range of processes of care (e.g. time required and allocated, question asking, counseling, referrals and likely follow-up) in addition to variability in diagnosis and certainty. The use of clinically authentic filmed vignettes is a distinct improvement over written scenarios or standardized patients. Unlike written scenarios, filmed vignettes permit important non-verbal cues (e.g. obesity, age, gender, race and the “Levine fist”) to be inserted without drawing special attention to them. A critical benefit of vignettes is that they allow for the manipulation of these key variables at once and the measurement of unconfounded effects (Veloski, Tai, Evans, & Nash, 2005). Furthermore, vignette-based studies allow for the collection of a large amount of information simultaneously from a large number of subjects, make efficient use of time, and are cost-effective, while also avoiding observer effects and ethical challenges commonly associated with standardized patients (McDaniel et al., 2007; Veloski et al., 2005). While there was understandable resistance to the use of filmed scenarios when they were first introduced, they have been shown in many studies to produce results that are both valid and useful (Dresselhaus, Peabody, Lee, Wang, & Luck, 2000;J. W. Peabody & Liu, 2007;J.W. Peabody, Luck, Glassman, Dresselhaus, & Lee, 2000). They have become part of the standard armamentarium in health services research, medical education and accreditation programs.

With respect to limitations, despite significant efforts to recruit physicians the response rate achieved was modest (38.5%). There is a well-recognized secular decline in response rates for physician surveys. With the corporatization of primary care doctoring, tight scheduling of patients, pay tied to throughput and performance, organizational discouragement of surveys and staff instructed to protect a physicians time, random sample surveys of physicians are likely to become cost prohibitive.

We introduced four precautionary steps in an attempt to protect external validity: (1) use of a random sample (which enhances generalizability); (2) the use of clinically active providers to generate clinically authentic scenarios (enhancing content validity);, (2) conducting all interviews in the practice office usually sandwiched between the physician’s own patients,

(3) insertion of questions concerning the typicality of the clinical scenarios (90% percent of physicians reported the scenarios were typical or very typical of their patients), and (4) explicitly instructing the subjects to view the patient as one of their own patients.

Conclusions

To avoid some limitations of observational methods, we conducted an experiment to identify differences between internists and family practitioners in decision making and processes of care when encountering exactly the same “patient” with signs and symptoms suggestive of CHD. Internists were significantly more likely to rank CHD first among possible diagnoses and were more likely to order a stress test and prescribe medications, while family practitioners were more likely to rank mental illness first and attached more certainty to it. There were significant differences between the two groups in important processes of care. It is likely that these differences result from contrasting models of disease employed during the training of internists and family practitioners (biophysiologic versus psychosocial respectively). Differences between medical specialties in the diagnosis and management of disease have been reported, but little attention has been given to possible differences within the specialty that encounters the majority of patients in the US, primary care. As the first point of contact for most patients and the gateway to the medical care system, primary care physicians crucially affect the course of disease and patient outcomes. Identifying and explaining differences between such physicians can contribute further understanding to the origins of healthcare variations and health disparities.

References

- Arber S, McKinlay JB, Adams A, Marceau LD, Link CL, O'Donnell AB. Influence of patient characteristics on doctors' questioning and lifestyle advice for Coronary Heart Disease: A UK/US video experiment. *British Journal of General Practice*. 2004; 54(506):673–678. [PubMed: 15353053]
- Berner ES, Graber ML. Overconfidence as a cause of diagnostic error in medicine. *American Journal of Medicine*. 2008; 121(5 suppl):S2–S33. [PubMed: 18440350]
- Burns RB, Freund KM, Moskowitz MA, Kasten L, Feldman H, McKinlay JB. Physician characteristics: do they influence the evaluation and treatment of breast cancer in older women? *American Journal of Medicine*. 1997; 103(4):263–269. [PubMed: 9382117]
- Cherkin DC, Rosenblatt RA, Hart LG, Schneeweiss R, LoGerfo J. The use of medical resources by residency-trained family physicians and general internists: Is there a difference? *Medical Care*. 1987; 25(6):455–469. [PubMed: 3695655]
- Cohen JW, Krauss NA. Spending and service use among people with the fifteen most costly medical conditions. *Health Affairs*. 2003; 22(2):129–138. [PubMed: 12674416]
- Conry CM, Pace WD, Main DS. Practice style differences between family physicians and internists. *Journal of the American Board of Family Practitioners*. 1991; 4(6):399–406.
- Croskerry P. Achieving quality in clinical decision making: cognitive strategies and detection of bias. *Academic Emergency Medicine*. 2002; 9(11):1184–1204. [PubMed: 12414468]
- Croskerry P. Clinical cognition and diagnostic error: applications of a dual process model of reasoning. *Advances in Health Sciences Education*. 2009a; 14:27–35. [PubMed: 19669918]
- Croskerry P. A universal model of diagnostic reasoning. *Academic Medicine*. 2009b; 84(8):1022–1028. [PubMed: 19638766]
- Dresselhaus TR, Peabody JW, Lee M, Wang MM, Luck J. Measuring compliance with preventive care guidelines: standardized patients, clinical vignettes, and the medical record. *J Gen Intern Med*. 2000; 15(11):782–788. [PubMed: 11119170]
- Gaufberg E, Joseph R, Pels R, Wyshak G, Wieman D, Nadelson C. Psychosocial training in U.S. internal medicine and family practice residency programs. *Academic Medicine*. 2001; 76(7):738–742. [PubMed: 11448833]

- Gawande A. The Cost Conundrum: What a Texas town can teach us about health care. *The New Yorker*. 2009 June 1.;36–55. [PubMed: 19663044]
- Goroll AH. *Primary Care Medicine: Office Evaluation and Management of the Adult Patient*. 6. Philadelphia: Lippincott Williams & Wilkins; 2009.
- Greenfield S, Nelson EC, Zubkoff M. Variations in resource utilization among medical specialties and system of care: results from the Medical Outcomes Study. *Journal of the American Medical Association*. 1992; 267(12):1624–1630. [PubMed: 1542172]
- Groopman, J. *How Doctors Think*. Boston: Houghton Mifflin Company; 2007.
- Holmboe ES, Bowen JL, Green M, Gregg J, DiFrancesco L, Reynolds EAP, et al. Reforming internal medicine residency training. A report from the Society of General Internal Medicine's task force for residency reform. *Journal of General Internal Medicine*. 2005; 20(12):1165–1172. [PubMed: 16423110]
- Institute of Medicine. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*. Washington, D.C.: The National Academies Press; 2003.
- Kravitz RL, Greenfield S, Rogers W, Manning W Jr, Zubkoff M, Nelson EC, et al. Differences in the mix of patients among medical specialties and systems of care: Results from the Medical Outcomes Study. *Journal of the American Medical Association*. 1992; 267(12):1617–1623. [PubMed: 1542171]
- Lutfey KE, Link CL, Grant RW, Marceau LD, McKinlay JB. Is certainty more important that diagnosis for understanding race and gender disparities?: An experiment using coronary heart disease and depression case vignettes. *Health Policy*. 2009; 89:279–287. [PubMed: 18701185]
- Lutfey KE, McKinlay JB. What happens along the diagnostic pathway to CHD treatment? Qualitative results concerning cognitive processes. *Sociology of Health and Illness*. 2009; 31(7):1077–1092. [PubMed: 19619155]
- Maserejian NN, Lutfey KE, McKinlay JB. Do physicians attend to base rates? Prevalence data and statistical discrimination in the diagnosis of coronary heart disease. *Health Services Research*. 2009; 44(6):1933–1949. [PubMed: 19780850]
- McDaniel SH, Beckman HB, Morse DS, Silberman J, Seaburn DB, Epstein RM. Physician self-disclosure in primary care visits: enough about you, what about me? *Archives of Internal Medicine*. 2007; 167(12):1321–1326. [PubMed: 17592107]
- McKinlay JB, Burns RB, Durante R, Feldman HA, Freund KM, Harrow BS, et al. Patient, physician and presentational influences on clinical decision making for breast cancer: results from a factorial experiment. *Journal of Evaluation in Clinical Practice*. 1997; 3(1):23–57. [PubMed: 9238607]
- McKinlay JB, Lin T, Freund K, Moskowitz M. The unexpected influence of physician attributes on clinical decisions: results of an experiment. *Journal of Health and Social Behavior*. 2002; 43(1): 92–106. [PubMed: 11949199]
- McKinlay JB, Link CL, Arber S, Marceau LD, O'Donnell AB, Adams A, et al. How do doctors in different countries manage the same patient? Results of a factorial experiment. *Health Services Research*. 2006; 41(6):2182–2200. [Erratum in 2141(2186):2303]. [PubMed: 17116115]
- McKinlay JB, Link CL, Freund KM, Marceau LD, O'Donnell AB, Lutfey KE. Sources of variation in physician adherence with clinical guidelines: results from a factorial experiment. *Journal of General Internal Medicine*. 2007; 22(3):289–296. [PubMed: 17356957]
- McKinlay JB, Potter DA, Feldman HA. Non-medical influences on medical decision-making. *Social Science and Medicine*. 1996; 42(5):769–776. [PubMed: 8685745]
- McPhee, SJ.; Papadakis, MA., editors. *Current Medical Diagnosis & Treatment*. 48. New York: McGraw Hill Medical; 2009.
- Medical Marketing Survey. 2001. from <http://www.mmslists.com/>
- Noren J, Frazier T, Althman I, DeLozier J. Ambulatory medical care: a comparison of internists and family-general practitioners. *New England Journal of Medicine*. 1980; 302(1):11–16. [PubMed: 7350394]
- Pauker SG, Kassirer JP. The threshold approach to clinical decision making. *New England Journal of Medicine*. 1980; 302:1109–1117. [PubMed: 7366635]
- Peabody JW, Liu A. A cross-national comparison of the quality of clinical care using vignettes. *Health Policy Plan*. 2007; 22(5):294–302. [PubMed: 17660225]

- Peabody JW, Luck J, Glassman P, Dresselhaus TR, Lee M. Comparison of vignettes, standardized patients, and chart abstraction: A prospective validation study of three methods for measuring quality. *Journal of the American Medical Association*. 2000; 283(13):1715–1722. [PubMed: 10755498]
- Rakel, RE., editor. *Textbook of Family Medicine*. 7. Philadelphia: Saunders Elsevier; 2007.
- Shackelton R, Link C, Marceau L, McKinlay J. Does the culture of a medical practice affect the clinical management of diabetes by primary care providers? *Journal of Health Services Research and Policy*. 2009; 14(2):96–103. [PubMed: 19299263]
- Smith DH, McWhinney IR. Comparison of the diagnostic methods of family physicians and internists. *Journal of Medical Education*. 1975; 50:264–270. [PubMed: 1113277]
- Taylor, RB., editor. *Family Medicine Principles and Practice*. 6. New York: Springer; 2003.
- The Accreditation Council for Graduate Medical Education. *Program Requirements for Graduate Medical Education in Internal Medicine*. 2009.
- Veloski J, Tai S, Evans AS, Nash DB. Clinical vignette-based surveys: a tool for assessing physician practice variation. *American Journal of Medical Quality*. 2005; 20(3):151–157. [PubMed: 15951521]
- Weinberger SE, Smith LG, Collier VU. Redesigning training for internal medicine. *Annals of Internal Medicine*. 2006; 144:927–932. [PubMed: 16601254]

Figure 1.
The Effect of Primary Care Specialty on Decision Making For A “Patient” With Signs and Symptoms of Coronary Heart Disease (n=367)

Figure 2.
Time Needed and Time Allocated to Typical Patient Appointments by Primary Care Specialty (n=367)

Figure 3.

Balance of Physician vs. Patient Control –

On the scale below please select one number on the continuum which best represents your opinion about levels of involvement in decision making about treatments (n=232).

Table 1

Symptoms embedded in the clinical vignette scenario

Classic Symptoms and Signs of Coronary Heart Disease
Chest pain, described as: <ul style="list-style-type: none"> • worsening with exertion • after eating a big or spicy meal • when in a stressful situation • relieved by rest • feels different from heartburn • duration of about 3 months
Pain in the back between the shoulder blades
High blood pressure
“Levine fist” – clenched fist to the sternum, as a nonverbal indicator of cardiac pain
Additional Symptoms and Patient Complaints *
Gastrointestinal discomfort (e.g. feeling “full all the time,” “gassy”)
Heartburn
Indigestion not relieved with antacids
Spouse says patient is not acting like her/himself lately
Mood changes: easily irritated, concerned
Low energy level

* These additional symptoms were included to more accurately represent how actual patients present and were not intended to make the physicians’ diagnostic task more difficult.

Table 2**Primary Care Specialty and Physician/Organizational Features**

	Family Practitioner n=192	Internal Medicine n=175	P-value
Physician Characteristics			
Physician Gender			
Male	94 (49.0%)	88 (50.3%)	0.80
Female	98 (51.0%)	87 (49.7%)	
Physician Experience			
More	82 (42.7%)	98 (56.0%)	0.01
Less	110 (57.3%)	77 (44.0%)	
Practice Setting			
Solo private practice	31 (16.1%)	27 (15.4%)	0.85
Small group private	40 (20.8%)	49 (28.0%)	0.11
Large group primary care practice	9 (4.7%)	24 (13.7%)	0.003
Hospital-based group	32 (16.7%)	29 (16.6%)	0.98
Community health center	31 (16.1%)	17 (9.7%)	0.07
Patient Attributes			
Patient Race			
Black	92 (47.9%)	88 (50.3%)	0.65
White	100 (52.1%)	87 (49.7%)	
Patient Gender			
Female	100 (52.1%)	80 (45.7%)	0.22
Male	92 (47.9%)	95 (54.3%)	
Patient SES			
Lower	97 (50.5%)	88 (50.3%)	0.96
Upper	95 (49.5%)	87 (49.7%)	
Patient Age			
75	91 (47.4%)	91 (52.0%)	0.38
55	101 (52.6%)	84 (48.0%)	