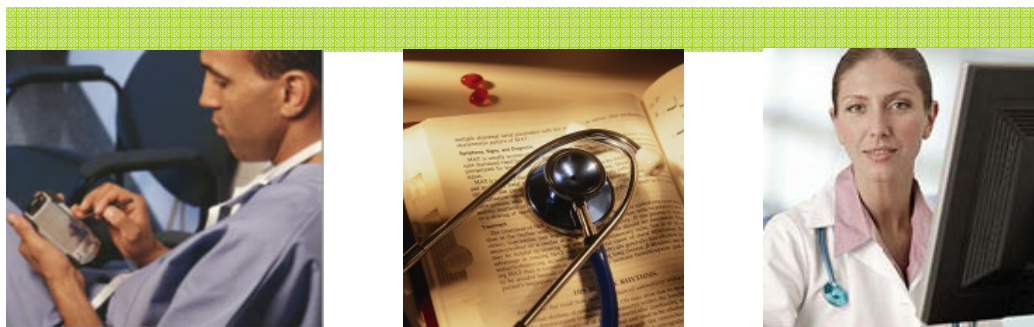


# Improving Physician Adherence to Clinical Practice Guidelines



## Barriers and Strategies for Change



New England Healthcare Institute

## ABOUT NEHI

Founded in 2002, the New England Healthcare Institute (NEHI) specializes in identifying innovative strategies for improving health care quality and reducing health care costs. NEHI conducts independent, high quality research that supports evidence-based health policy recommendations at the regional and national levels. Member representatives from the academic health center, biotechnology, employer, medical device, payer, pharmaceutical, provider and research communities bring an unusual diversity of talent to bear on NEHI's work. We collectively address critical health issues through our action-oriented research, education and policy initiatives.

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Barriers and Strategies for Change



New England Healthcare Institute

February 2008

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## Executive Summary

Adults in the United States receive only about half of the health care they need when they need it. The practice of medicine also varies significantly by geography – where you happen to live – for reasons unrelated to our health. Evidence-based clinical practice guidelines – rules of the road for doctors – can be a key tool for improving the quality, outcomes and cost effectiveness of health care, so understanding the barriers to the adoption of these guidelines is crucial.

How to identify and remove waste and inefficiency from the health care system has been a major area of research for the New England Healthcare Institute (NEHI). In 2007, with support from the Pharmaceutical Research and Manufacturers of America (PhRMA), NEHI began an investigation into the question of why there are gaps between agreed-upon standards of care and the actual care provided. Research methods included: a comprehensive literature review of 82 publications; key informant interviews; an online survey of 231 physicians nationwide; and an expert panel entitled “Cookbook or By the Book: A Symposium Exploring Physician Resistance to Clinical Practice Guidelines.”

### BARRIERS

NEHI’s research points to four main barriers to physician guideline adherence: the payment system; the lack of information technology systems; physician culture, beliefs and habits; and the development and the function of guidelines.

#### Payment

The payment system is problematic for guideline adherence because we pay for *volume* of procedures rather than for *outcomes*, because most existing pay for performance programs do not provide financial incentives sufficient to change behavior, and because there is lack of uniformity in payer policies which diffuses the effect of pay for performance programs.

#### IT Systems

Lack of information technology (IT) systems is a barrier because, at current adoption levels, physicians have insufficient access to guidelines at the point of care; because IT can, but doesn’t yet, broadly and adequately support clinical decision-making; and because there are insufficient resources to support adoption, staff training and maintenance of IT systems, especially for small or solo practices.

### Physician Culture

The culture, beliefs, and habits of physicians are barriers because many doctors receive little or no comparative feedback on their performance, as reflected by adherence to evidence-based clinical practice guidelines. As a result, they tend to rely on their own judgment and personal experience to determine whether or not they are doing the right thing for patients.

### Guideline Development

The current process of development and the function of many guidelines present their own obstacles to adherence. In particular, the lack of transparency in guideline development leads to a lack of trust among physicians while guidelines themselves often lack sufficient flexibility and relevance to clinical practice. Many guidelines do not reflect the complexity and context in which real clinical decisions must be made.

## STRATEGIES FOR CHANGE

Despite these significant barriers to adherence, there is reason to be optimistic about the future impact of clinical practice guidelines on quality and cost. Physicians believe that guidelines will have a major influence on clinical decision-making over the next five years. However, the system improvements we need to improve guideline development and overcome barriers to adherence will not happen unless major stakeholders pursue proactive change strategies. This report offers five recommendations to address the most significant barriers to guideline adoption:

- 1 *Pay the right amount for quality and activities that support adherence and coordinate Pay for Performance programs across payers.* Our survey data show that significant increases in Pay for Performance incentives may accelerate the adoption of guidelines. Demonstration programs are needed to determine the right level of payment incentives and as more payers implement such programs, the standardization and coordination of such programs will be critical to their success.
- 2 *Invest in and encourage IT innovations that advance clinical decision support.* To support guideline adoption, IT systems need to provide useful data to the physician at the point of care; feedback loops so physicians can measure their practice patterns against other colleagues; interoperability between inpatient and outpatient facilities and among physicians; and flow diagrams and algorithms that enable physicians to exercise autonomy and clinical judgment and respond to patient preferences.
- 3 *Encourage innovation in guideline development and use.* To improve physician “buy-in” to guidelines, physicians need to be engaged in the guideline development and review process. In addition, because guidelines become obsolete so quickly, it is important to speed the process of





guideline development so that the dissemination and use of guidelines keeps pace with medical advances. Finally, guidelines need to be actionable, brief and written in “plain English.”

- 4 *Train physicians on guideline usage.* The expert panel and literature suggest that training of medical students, residents and practicing physicians may be necessary to re-orient practice toward guidelines.
- 5 *Enable and promote comparative data sharing among physicians.* To change physician culture, beliefs and habits, data collection and data sharing are essential. While there is much debate about the value of public reporting of physician quality measures and outcomes, expert panelists and key informants agree that transparency *within* physician practices – that is, allowing a physician to compare data on his/her own practice to that of his/her peers – is extremely effective in fostering adherence to guidelines.

Only by taking these steps can we transform the status quo and move the needle on guideline adherence.





## Clinical Practice Guidelines: An Overview

The U.S. spends more money on health care than any other nation in the world. According to Medicare actuaries, we will spend nearly \$2.3 trillion on health care in 2007, or approximately 17 percent of the nation's GDP. Spending on health care is expected to grow to 20 percent of GDP by 2017. Many experts believe that a significant portion of our health care dollars are wasted, with estimates suggesting that up to 30 percent of total spending could be eliminated without reducing health care quality. A number of factors drive waste in the health care system. One key cause is the lack of physician adherence to clinical practice guidelines, which raises a variety of questions about factors that motivate physicians' clinical decisions. Although uncertainty in the practice of medicine contributes to waste, we are far from consistently doing the right thing, even when clear evidence exists about the "right thing" to do. This, in short, leads to poor quality in medical care, defined as underuse, overuse and misuse.

Greater adherence to evidence-based clinical guidelines is critical to improving U.S. health care. Adults receive only about half of the right care at the right time.<sup>1</sup> Moreover, we know that the practice of medicine varies significantly by geography – where you happen to live – for reasons that are not related to our health. We can provide better care and care at a lower cost through the use of clinical guidelines.<sup>2,3</sup> But to do so, we need to better understand the barriers – attitudinal, financial, and other – that impede their increased use and identify strategies to overcome those barriers. Understanding barriers to the adoption of clinical practice guidelines is a key ingredient to improving outcomes and achieving a more efficient health care system.

In 2007, with support from the Pharmaceutical Research and Manufacturers of America (PhRMA), the New England Healthcare Institute (NEHI) completed a multidimensional research project to better understand why major gaps exist between the agreed upon standards of care and the care that is actually delivered to patients. Through this project, we have performed the following research:

- 1 *A comprehensive review of the literature* – Conducted to assess what is known about rates of utilization of clinical practice guidelines and the obstacles to their use. In total, 82 publications (see **Appendix A**) were reviewed, summarized and used to inform interviews with experts in the field.
- 2 *Key informant interviews* – Conducted to understand the obstacles to guideline adoption among physicians. See **Appendix B** for names and affiliations of the key informants. The key informant interviews pointed to attitudinal factors among physicians as an important barrier to guideline adherence. This information was used in developing NEHI's physician survey.

- 3 *An on-line physician survey* – Developed in partnership with Harris Interactive to improve our understanding of physicians’ attitudes toward evidence-based medicine and treatment guidelines while also investigating how incentives could be changed to improve quality of care or Pay for Performance programs. Key findings from the survey are discussed throughout this report and are summarized in the Harris Interactive newsletter in **Appendix C**. The survey methodology can be found in **Appendix D**. The results of this survey were used as a catalyst for discussion among NEHI’s panel of experts.
  
- 4 *A half-day expert panel entitled “Cookbook or By the Book: A Symposium Exploring Physician Resistance to Clinical Practice Guidelines”* – Convened on July 9, 2007 to further elucidate the barriers to guideline adherence, understand which barriers pose the greatest obstacles, and identify strategies for health care leaders to work together to increase provider guideline adoption. Following a presentation of the physician survey results, a professional facilitator guided discussion among the expert panelists to identify barriers. Panelists and session participants were asked to select and prioritize the top three obstacles to guideline adherence. The session concluded with a brief panel discussion of strategies to overcome the greatest barriers to guideline use. Barriers to guideline adherence are discussed on pages 9 – 13 of this report. Strategies for improving guideline adherence are discussion on pages 15 – 19. Expert panelist bios can be found in **Appendix E**.



## Physician Survey Findings

NEHI commissioned a Harris Interactive survey for this project. In April 2007, 231 physicians were surveyed including primary care providers and specialists (we oversampled cardiologists and orthopedists because they represent two substantially different ends of the spectrum of guideline use). The survey yielded important findings about differences and similarities in guideline use among physicians. Key findings are summarized below and associated figures are presented in **Appendix F**.

- ✓ **Guideline use does not vary much between younger and older physicians.** The survey inquired about use of guidelines, analyzing differences by age of physicians (40 and under versus over 40). Although differences exist, they were not significant: 36 percent of younger physicians rated themselves as heavy users of clinical guidelines as compared to 25 percent of older physicians. (Appendix F, Figure 1)
- ✓ **Most physicians describe themselves as “light” users of guidelines.** Regardless of age, the majority of physicians rated themselves as light users of clinical practice guidelines. Seventy-five percent of physicians over age 40 consider themselves light users of clinical guidelines and 64 percent of physicians 40 or younger consider themselves light users. (Appendix F, Figure 1)
- ✓ **Cardiologists encounter fewer barriers and are far more likely to adhere to guidelines than other types of physicians.** Survey questions were formulated using the Stages of Change Model to assess where along the continuum, from pre-contemplation to action/adherence, physicians are with clinical guidelines. The majority of Cardiologists (70 percent) fell into the action/adherence phase, as compared to 47 percent of primary care providers, 34 percent of other specialists, and 25 percent of orthopedists. The survey also found that cardiologists are less likely to encounter typical barriers (i.e., lack of awareness of or disagreement with guidelines, lack of technology, reimbursement issues, attitudes about convenience or effectiveness of guidelines, and uncertain diagnosis) that reduce the likelihood of guideline adherence. (Appendix F, Figure 2 and Figure 3)
- ✓ **Technology and reimbursement are more important barriers for small and solo practices as compared to large practices.** One-third of physicians in solo or small practices, as compared to only one in twenty in large practices, reported that their offices did not have the technology to properly implement guidelines, and 27 percent of those in solo/small practices reported that they are not reimbursed for activities related to guideline implementation, as compared to nine percent of those in large practices. (Appendix F, Figure 4)

The survey also identified factors that are likely to affect guidelines adherence:

- ✓ ***Relevance to physician practice is a more important attribute of clinical guidelines than cost effectiveness.*** In fact, 88 percent of physicians surveyed said they would be more likely or much more likely to use guidelines they see as relevant to the way they practice medicine as compared to 67 percent who indicated they would be influenced by guidelines that are intended to ensure cost effectiveness of medical care. (Appendix F, Figure 5)
  
- ✓ ***Money matters a lot for increasing adherence.*** The survey showed that reimbursement is strongly tied to reported likelihood of adherence. Financial incentives appear to be stronger drivers of adherence to clinical practice guidelines than attitudes towards them or their general accessibility. The physician survey inquired whether three different bonus levels would increase the likelihood of adherence with a clinical guideline for Medicare patients that required an additional 10 minutes of work per patient on the part of the physician or his/her staff. At the lowest bonus level (2 percent of Medicare reimbursement), 1 out of 20 physicians would be somewhat or much more likely to adhere to guidelines. At 9 percent, 1 out of 6 physicians would be more likely to adhere. At the highest bonus level (20 percent of Medicare reimbursement bonus), 1 in 2 reported that they would be more likely to comply. (Appendix F, Figure 6)



## Barriers to Guideline Adherence

The literature review, key informant interviews, and expert panel point to four main categories of barriers to physician guideline adherence:

1. The payment system;
2. Lack of information technology systems;
3. Physician culture, beliefs and habits; and
4. The guideline development process and utility and function.

These barriers are described in detail below.

### THE PAYMENT SYSTEM

The problem the payment system presents to guideline adherence is three-fold:

- a. Payment for service volume rather than quality of outcomes;
- b. Pay for Performance programs today do not pay enough; and
- c. Lack of uniformity leads to diffusion of the effects of Pay for Performance programs.

*a. Payment for service volume rather than quality of outcomes:* The panel and key informants agreed that the current payment system, for the most part, rewards physicians for doing more and not necessarily for doing the right thing (as defined by evidence based clinical practice guidelines). Under traditional fee-for-service reimbursement arrangements, financial incentives primarily are tied to the volume of procedures performed. If quality is the goal, payments need to be structured to maximize quality of care, not quantity.<sup>4,5,6</sup>

*b. Pay for Performance programs today do not pay enough:* Although money does not appear to be the primary reason the physicians surveyed went into medicine, data show that it can influence the way they practice. When asked about factors influencing career satisfaction, the majority of physician survey respondents reported that the ability to have a positive impact on patients' lives was very important to them. However, when asked whether three different bonus levels would increase the likelihood of adherence to guidelines, each bonus increase resulted in a three-fold growth in the likelihood of guideline adoption. At the lowest bonus level (2 percent of Medicare reimbursement), only 5 percent of physicians said they would be much more likely to adhere to guidelines, which suggests that small incentives are ineffective.

*c. Lack of uniformity leads to diffusion of the effects of Pay for Performance programs:* Although many, perhaps most, health care practitioners and administrators agree that the current payment system requires reform, many are not convinced that Pay for Performance alone is necessarily the answer.<sup>7</sup> The lack of uniformity in payer policies contributes to low adherence by requiring practitioners to keep track of differing levels of reimbursement for various procedures among many different payers.<sup>8</sup>

## LACK OF INFORMATION TECHNOLOGY SYSTEMS

There is little dispute that information technology (IT) has an integral role in evidence-based medicine and the successful use of clinical guidelines.<sup>9,10</sup> However, the availability of technology alone will not be sufficient to increase physician adherence to practice guidelines. The following are issues related to guideline adoption and IT:

- a. Insufficient access to guidelines at the point of care;
- b. Insufficient IT support for clinical decision-making; and
- c. Insufficient resources to support adoption, staff training, and maintenance of IT systems.

*a. Insufficient access to guidelines at the point of care:* Physicians need timely and easy access to diagnostic and treatment guidelines. Bulky, paper manuals are likely to sit on a shelf and go unused.<sup>11</sup> IT systems, in contrast, can provide the hardware and software necessary to bring guidelines to the point of care, giving providers access to timely, usable, patient-relevant information.<sup>12,13</sup> Our expert panel and session participants identified the inability to access guidelines easily and to determine where patients are on a given guideline as the second greatest obstacle to guideline adherence. Moreover, over two-thirds of physicians surveyed expressed agreement that the greater the effort required to access guidelines, the less likely they would be to use them.

*b. Insufficient IT support for clinical decision-making:* The increasing availability of IT in health care systems will facilitate guideline adherence if it gives physicians access to information and feedback that helps them practice medicine. Although the adoption of electronic medical record systems is radically changing the ability to capture, access and utilize patient data, this information will promote guideline adherence to the extent that it also enhances decision support capabilities.

Such systems should also allow physicians to generate reports on their practice, enabling them to monitor their own adherence relative to that of similarly situated physicians. Panelists also noted that IT driven guideline technology should, when appropriate, allow physicians to override the system so they can apply clinical judgment and/or respond to patient preferences.<sup>14</sup>

*c. Insufficient resources to support adoption, staff training, and maintenance of IT systems:* Although development and implementation of IT in medical settings has increased dramatically since 2000, we have a long way to go.<sup>15</sup> While some health systems and physician practices have very sophisticated systems that are widely used, many others do not. The difference between small and large practices is particularly acute.<sup>16</sup> The physician survey revealed that one-third of solo or small practices, as compared to only one in twenty large practices, do not have the computer technology to properly implement clinical guidelines. The survey also found variations by medical specialty. Not having the technology to properly implement guidelines poses a greater obstacle to primary care physicians and orthopedists than to cardiologists and other specialists.





Although adherence to guidelines promises to increase quality and, in many cases, save costs, investment in IT may initially raise the costs of guideline adoption.<sup>17</sup> Physicians and administrators face difficult choices about where to invest limited health care resources. Linking incentives to guideline adherence would certainly help encourage providers to make significant investments in IT.<sup>18</sup>

#### PHYSICIAN CULTURE, BELIEFS AND HABITS

It has been observed broadly in the literature, as well as among our expert panelists, that physicians base clinical decisions on their personal experience, even when evidence-based clinical practice guidelines might suggest a different course of action. Although there are a number of reasons for this, it is due in part to the attitudes and beliefs held by some within this professional culture. Consider for instance, that a large majority of physicians are engaged in solo and small practices. Over one-third of these physicians, compared to only one-tenth of those in large practices, agree with the statement that “my own experience and training will yield better outcomes for patients than guidelines would.”

Moreover, the third largest barrier determined by our expert panelists was that physicians generally believe that their own clinical practice is good. Yet, many physicians receive little or no feedback on the quality of their practice, particularly in comparison with that of their peers or accepted guidelines. Thus, doctors must rely on their own judgment about whether they are doing the right thing for patients. As one expert panelist noted, “*Today, physicians are living in a data-free world.*” Unfortunately, this sounds very similar to an observation reported in the literature fifteen years ago: “Not knowing what they don’t know” when making decisions causes physicians to be overly confident about their own judgment.<sup>19</sup>

It seems logical that physicians would be motivated to modify their practice if they received feedback indicating that their treatment choices are inconsistent with that of their peers or accepted guidelines. However, communicating information to physicians on their practice alone (i.e., not comparing them with their peers), or on their practice group as a whole has not produced the desired behavior change. A more effective information sharing approach is to give physicians data on their practice behavior relative to that of other similarly situated physicians so they can compare themselves to others like them.<sup>20</sup>

#### GUIDELINE DEVELOPMENT PROCESS AND FUNCTION

The current form, function and development process of guidelines present their own obstacles to adherence, particularly:

- a. The lack of transparency in guideline development; and
- b. The lack of sufficient flexibility and relevance to physician practice.

*a. The lack of transparency in guideline development:* Consensus is a necessary condition for guideline adherence, but a lack of transparency in the process of development and a lack of confidence in the data behind guidelines are important reasons for physician non-adherence.<sup>21</sup> Key informants and expert panelists

reported that physicians tend to be suspicious of the motives behind clinical guidelines. This is especially true when medical device and pharmaceutical companies or professional societies are involved in guideline development.<sup>22</sup> Physicians suspect that the majority of guidelines are intended to reduce costs of care, although very few believe they are effective in doing so.<sup>23</sup> Physicians also fear that guidelines will be used in disciplinary and legal actions, to reduce reimbursements, or to question their clinical competency.<sup>24,25,26,27</sup> Physicians surveyed reported that they are more likely to use guidelines that are written by credible sources with a sound methodology.

The expert panel and key informants explained that physician agreement with guidelines is often based on how credible physicians find the evidence base of guidelines to be. Common standards of guideline development are needed because, although physician interest in guidelines is substantial, many do not believe guidelines are sufficiently grounded in evidence or trust the process by which the guideline was developed.<sup>28</sup> For many of the guidelines there is a lack of evidence in the literature and, for those where data are available, there is skepticism about whether the research was performed properly.<sup>29,30</sup> Many existing guidelines are based on a mix of science and opinion, resulting in confusing and conflicting messages that physicians must decipher.<sup>31</sup> Finally, panelists voiced the concern that following a guideline not based in concrete evidence could result in an unfavorable judgment about the quality of a doctor's care, particularly if that judgment is based on an assessment of the patient's outcomes.<sup>32</sup>

*b. The lack of sufficient flexibility and relevance to physician practice:* The Harris Interactive survey, expert panel, key informants and the literature all suggest that resistance to clinical guidelines may be attributed to perceived threats to physician autonomy.<sup>33,34,35</sup> Having to justify treatment decisions on a continuing basis, particularly on grounds not strictly clinical in nature, causes many physicians to view guidelines as intrusive, limiting their treatment options, and/or disregarding their judgment or patient preferences.<sup>36,37</sup> Interestingly, only 25 percent of physicians surveyed expressed agreement that guidelines undermine their autonomy as a physician, but most (88 percent) said that they are more likely to use guidelines that are relevant to the way they practice medicine. It would seem that, to be most effective, guidelines should complement, rather than be a substitute for, clinical judgment.<sup>38</sup> The expert panel also suggested that guidelines might be perceived as inhibiting innovation, replacing it with cookie cutter approaches to care.

Ironically, guidelines may be seen as lacking relevance to clinical practice both because they are too complex and too simple. On the one hand, we learned that adherence to guidelines is stymied because they may not be sufficiently precise or provide clear pathways of action, there may be so many guidelines that it is difficult to know which to follow, and they can be dense and difficult to use in practice.<sup>39,40,41,42</sup> On the other hand, guidelines can be overly simplistic – leading to the “cookbook” criticism – when they fail to allow for nuance and considering unique conditions.<sup>43,44,45,46</sup> In addition, in some situations, there is conflict among guidelines for a patient's various conditions. To resolve these problems,



translational research and guidelines for co-morbidities and breadth of practice, especially for primary care, are needed. Moreover, the expert panel observed that, when appropriate, guidelines should be viewed as flexible tools used to assist in the practice of medical decision making. Finally, guidelines may also lack relevance if they rapidly become obsolete. As one expert panelist observed, *“Guidelines need to be current. They get old quickly.”* In some cases, current guidelines are not keeping pace with the need for better information to guide decision-making and the increasing complexity of disease management.<sup>47</sup>





## Solutions for Improving Guideline Adherence

Despite the significant barriers to adherence detailed above, there is reason to be optimistic about the future of clinical guidelines. As Table 1 shows, regardless of medical specialty, physician survey respondents believe evidence-based medicine and clinical guidelines will have the strongest influence on clinical decision-making over the next three to five years, more than health IT, Pay for Performance and other payment changes.

**Table 1. Trends affecting clinical decision-making in the next three to five years**

<i>Impact of trends on future clinical decision-making</i>	<i>N=231</i>
<i>Evidenced-based medicine</i>	<i>77 percent</i>
<i>Clinical guidelines</i>	<i>67 percent</i>
<i>Health information technology</i>	<i>54 percent</i>
<i>Changes in practice reimbursement</i>	<i>39 percent</i>
<i>Pay-for-performance incentive from payers</i>	<i>26 percent</i>
<i>Consumer-directed healthcare</i>	<i>17 percent</i>

**Source: NEHI/Harris Interactive Survey**

The expert panel described a convergence of circumstances that may constitute a tipping point with regard to guideline adherence. More people are paying attention to the use (or underuse) of guidelines because they see the value that greater physician adherence can bring to cost reduction and quality improvement. The health IT world is evolving rapidly (e.g., increased use of electronic medical records and e-prescribing). Our ability and motivation to measure outcomes is improving. There is more evidence on which to base clinical guidelines. However, the substantial improvements we need to make to decrease barriers will not happen unless we take proactive steps to innovate in a number of areas. Below, we offer five recommendations to address the most significant barriers to guideline adherence identified in this project.

### **PAY THE RIGHT AMOUNT FOR QUALITY AND ACTIVITIES THAT SUPPORT ADHERENCE AND COORDINATE PAY FOR PERFORMANCE ACROSS PAYERS**

To drive adoption and adherence to physician practice guidelines, coverage policies should reward those who achieve high performance outcomes. Therefore, it is critical to examine the payment system and how it can be used

more effectively to address variations in care. If we agree that we pay for the wrong things now, we should decide what the right things are and pay the right amount for them.

The physician survey probed whether three different bonus levels would increase the likelihood of adherence to a clinical guideline for Medicare patients. This guideline would require an additional 10 minutes of work per patient on the part of the physician or his/her staff. At the lowest bonus level (2 percent of Medicare reimbursement) 5 percent of physicians said they would be much more likely to adhere to guidelines. At the highest bonus level (20 percent of Medicare reimbursement), 48 percent reported that they would be much more likely to comply. According to the Institute of Medicine, financial incentives should be used to encourage physicians to use guidelines and achieve better outcomes.<sup>48</sup>

Moreover, because physicians are unlikely to engage in more than one Pay for Performance initiative at a time, it is critical for payers to coordinate their initiatives so that physicians are not required to choose among competing initiatives. As more payers implement Pay for Performance programs, the need for standardization and coordination will increase.

The current payment system rewards specialists over primary care physicians. We should pay primary care doctors to coordinate management of chronic conditions and reimburse them for the medical home concept. In order to achieve this, we need to make the shift from payment for visits toward population-based medicine. Reimbursement should encourage physicians to change their practice habits. As one expert panelist explained, *"We need to change the self-perception of physicians from being an individual craftsman to being a team-based scientist."* We also need to ensure that the payment system does not favor large practices, leaving small practices unable to invest in IT and perform guideline-related activities. Finally, to address time and physician workload issues, we should consider appropriate payment for other clinical professionals (e.g., nurses, physicians' assistants) to perform those guideline-related activities that do not require physician involvement. According to the expert panel, multi-disciplinary care delivery teams can offer cost-effective ways of achieving desired clinical outcomes, but only if payers will reimburse accordingly.

To determine the impact of payment on guideline adherence, the expert panel recommended conducting demonstration projects that will test payment incentives that do not pay when performance objectives are not achieved.

#### INVEST IN IT INNOVATIONS THAT ADVANCE CLINICAL DECISION SUPPORT

The literature, key informants and our expert panel recommended several IT innovations to improve access to guidelines, support clinical decision-making, allow for exchange and comparison of clinical data among physicians, and provide physicians with flexibility and tools to simplify guideline use. First, IT should be useful in clinical decision-making and should, therefore, permit physicians to easily access subsets of patient information, as well as clinical guidelines and their evidence base, at the point of care. IT systems should also



allow physicians to locate their patient on a clinical guideline while, at the same time, allowing physicians to override the system and exercise autonomy based on their clinical judgment and to respond to patient preferences. Second, IT should allow physicians to use data to inform their practice. IT should provide aggregated data in e-files and enable the capacity for feedback and comparison so physicians can measure their practice patterns relative to those of their colleagues. The capability for such comparisons can serve as an important catalyst for behavior change. Third, IT should support effective communication among physicians involved in a patient's care. IT systems should, therefore, be interoperable, from outpatient to hospital to nursing home settings, and allow information to be shared among physicians. Patients should also be tracked through their medical records, rather than through claims. Fourth, IT should be used to make guidelines as user-friendly as possible, providing flow diagrams and algorithms or pre-printed orders that contain strategies that will minimize re-admissions, encourage patient self-management, and improve treatment process.<sup>49</sup> Finally, to ensure effective implementation of guidelines, standards for how guidelines are embedded within IT should be developed.

#### ENCOURAGE INNOVATION IN GUIDELINE DEVELOPMENT AND USE

We identified three innovations in guideline development that are likely to improve physician adherence:

- a. Engage physicians in guideline development and review process;
- b. Expedite new research to support guideline development; and
- c. Make guidelines actionable.

*a. Engage physicians in guideline development and review process:* To create change, we must bring the right players to the table and create an environment for discussion and debate. As one expert panelist described, "Guidelines need to be done *with* physicians, not *to* physicians." Because physicians are suspicious about the motives behind guideline development and skeptical about data that support them, we should engage physicians in the development and review of guidelines, creating transparency and trust in the development process. Once physicians are engaged in the process, it will be critical to prioritize the outcomes we want to achieve, thus limiting the number of guidelines to the most critical, and determine the appropriate measures based on sound clinical evidence.<sup>50</sup> Data used to inform clinical guidelines should be subjected to peer review.

*b. Expedite new research to support guideline development:* The expert panel, key informants, and the literature suggest that because guidelines, or specific components of them, can become obsolete quickly, it is important to extend our understanding of ways we can speed knowledge creation and information production.

*c. Make guidelines actionable:* Of course guidelines should make care safe, effective, timely, efficient and equitable.<sup>51</sup> But steps must be taken to make them easier to use or "actionable." According to the Institutes of Medicine, guidelines should:

- Be clear (unambiguous), evidence-based, valid (lead to a desired outcome) and reliable;
- Have clinical applicability (apply to populations) and flexibility (to accommodate provider judgment and patient preference);
- Be generated using a multidisciplinary process (e.g., physicians and other staff who will use guidelines and administrators who are accountable for the reporting of health system outcomes and negotiating reimbursement with payers); and
- Be subject to documentation and regular review (in light of new clinical evidence).<sup>52,53</sup>

“Plain English” guidelines would lead to stronger intent to implement and more positive attitudes among physicians, as well as a greater perceived control over using them.<sup>54</sup> Moreover, guidelines that are brief (under two pages in length) stand the greatest chance of being utilized.<sup>55</sup>

Even the most promising clinical guideline will not yield positive outcomes if it cannot be properly implemented. The Yale University Center for Medical Informatics and Schools of Medicine and Nursing developed the GuideLine Implementability Appraisal (GLIA) tool to help those developing and implementing guidelines to better understand and anticipate barriers to successful implementation. It is important to understand whether failure to achieve desired outcomes is related to practice versus other factors, such as a guideline that cannot be operationalized.<sup>56</sup> Although additional studies are necessary, early research shows that GLIA is useful because it evaluates guidelines across 10 dimensions, such as executability, formatting, novelty/innovation, flexibility, validity, etc. Such a tool could be useful in selecting guidelines that have the best chance of achieving positive outcomes.

#### TRAIN PHYSICIANS ON GUIDELINE USAGE

Many models of behavior change exist, but awareness is a key element of behavior change.<sup>57-58-59-60</sup> The expert panelists and literature suggest that training may be necessary to re-orient practice toward guidelines.<sup>61-62-63-64-65-66</sup> Education of medical students, residents and practicing physicians should include three concepts: (1) The benefits of treating to therapeutic targets, (2) Practical complexity of treating to targets for different disorders, and (3) The need to structure routine practice to facilitate effective management of disorders for which resolution of symptoms is not sufficient.<sup>67</sup> Others argue that physicians require further education about the process of quality improvement.<sup>68</sup>

#### ENABLE AND PROMOTE COMPARATIVE DATA SHARING AMONG PHYSICIANS

A critical step in improving the quality of care is the routine measurement of health care performance and availability of that information.<sup>69</sup> But how that information is used is equally important. Controversy exists about the value of public reporting that makes physician or practice-level data on quality available to the public. Despite the controversy, many states are moving toward public reporting. Expert panelists and key informants contend that transparency *within* physician practices, allowing a physician to compare data on his/her own practice





to that of his/her peers, will be more effective in fostering guideline adherence than public reporting. As one expert panelist noted, *“Quantum leaps in guideline adherence have been made by the transparency of comparative data amongst physicians in large practices.”* The panelists and key informants consider the capacity for delivering comparative feedback via electronic means a requisite attribute of IT systems in the age of clinical practice guidelines.

In this project we have focused on the most important barriers to enhanced use of evidence-based clinical practice guidelines. We have supplemented the evidence that exists in the medical literature with the collection of survey data from physicians and the views of national experts. We have identified solutions – strategies for change – that can lead directly to significant improvements in the health care system. This project is part of NEHI’s larger body of work focused on waste and inefficiency in the U.S. health care system. We will continue to bring related, follow-on projects to fruition, meeting our ultimate mission of transforming health care by saving lives and saving money.



# APPENDICES

## Appendix A: Literature Review

Author	Title	Citation
Andrade, SE; Gurwitz, JH; Field, TS; Kellehe, M; Majumdar, SR; Reed, G; Black, R	Hypertension Management: The Care Gap Between Clinical Guidelines and Clinical Practice	<i>The American Journal of Managed Care</i> . 2004. Jul;10(7 Pt 2):481-6
Barti, E; Grilli, R	Practice guidelines and clinical governance: do the means match with the ends? A quality appraisal of local practice guidelines	<i>Clinical Governance: An International Journal</i> . 2003. 8(4): 312-317
Billings, J	Promoting The Dissemination Of Decision Aids: An Odyssey In A Dysfunctional Health Care Financing System	<i>Health Affairs - 2004;Suppl Web Exclusives:VAR128-32.</i>
Blumenthal, D	Decisions, Decisions: Why The Quality Of Medical Decisions Matters	<i>Health Affairs - 2004;Suppl Web Exclusives:VAR124-7.</i>
Bodenheimer, T; May, JH; Berenson, RA; Coughlan, J	Can Money Buy Quality? Physician Response To Pay For Performance	<i>Center for Studying Health System Change. Issue Brief No. 102. 2005. Dec;(102):1-4</i>
Borkowski, NM; Allen, WR	Does Attribution Theory Explain Physicians' Nonacceptance of Clinical Practice Guidelines?	<i>Hospital Topics: Research and Perspectives on Healthcare</i> . 2003. Spring;81(2):9-21.
Brand, C; Landgren, F; Hutchinson, A; Jones, C; Macgregor, L; Campbell, D	Clinical practice guidelines: barriers to durability after effective early implementation	<i>Internal Medicine Journal</i> . 2005. Mar;35(3):162-9.
Browman, GP	Improving Clinical Practice Guidelines for the 21st Century: Attitudinal Barriers and Not Technology Are the Main Challenges	<i>International Journal of Technology Assessment in Health Care</i> . 2000. Autumn;16(4):959-68.
Buchan, H	Gaps between best evidence and practice: causes for concern	<i>The Medical Journal of Australia</i> . 2004. Mar 15;180(6 Suppl):S48-9.

Author	Title	Citation
Buchan, H; Sewell. JR; Sweet, M	Translating evidence into practice	<i>The Medical Journal of Australia.</i> 2004. Mar 15;180(6 Suppl):S43.
Burgers, JS; Cluzeau, FA; Hanna, SE; Hunt, C; Grol, R	Characteristics of High-Quality Guidelines: Evaluation of 86 Clinical Guidelines Developed in Ten European Countries and Canada	International Journal of Technology Assessment in Health Care. 2003. Winter;19(1):148-57
Cabana, MD; Rand, CS; Powe, NR; Wu, AW; Wilson, MH; Abboud, PA; Rubin, HR	Why Don't Physicians Follow Clinical Practice Guidelines? A Framework for Improvement	<i>The Journal of the American Medical Association.</i> 1999. Oct 20;282(15):1458-65.
Cockburn, J	Adoption of evidence into practice: can change be sustainable?	<i>The Medical Journal of Australia.</i> 2004. Mar 15;180(6 Suppl):S66-7.
Cohen, J	Are clinical practice guidelines impartial?	<i>International Journal of Technology Assessment in Health Care.</i> 2004. Fall;20(4):415-20
Connis, RT; Nickinovich, DG; Caplan, RA; Arens, JF	The Development of Evidence-Based Clinical Practice Guidelines: Integrating Medical Science and Practice	<i>International Journal of Technology Assessment in Health Care.</i> 2000. Autumn;16(4):1003-12.
Davenport, E	Clinical Guidelines and the Translation of Texts Into Care: Overcoming Professional Conflicts Concerning Evidence-Based Practice	<i>Journal of Documentation.</i> 2000. Sept 56(5):505-519
Davis, DA; Ciurea, I; Flanagan, TM; Perrier, L	Solving the information overload problem: a letter from Canada	<i>The Medical Journal of Australia.</i> 2004. Mar 15;180(6 Suppl):S68-71.
Del Mar, CB; Mitchell, GK	Feedback of evidence into practice	<i>The Medical Journal of Australia.</i> 2004. Mar 15;180(6 Suppl):S63-5.

Author	Title	Citation
Eccles, MP; Grimshaw, JM	Selecting, presenting and delivering clinical guidelines: are there any "magic bullets"?	<i>The Medical Journal of Australia</i> . 2004. Mar 15;180(6 Suppl):S52-4.
Ellrodt, AG; Conner, L; Riedinger, M; Weingarten, S	Measuring and Improving Physician Compliance with Clinical Practice Guidelines: A Controlled Inerventional Trial	<i>Annals of Internal Medicine</i> . 1995. Feb 15;122(4):277-82.
Epstein, AM	Pay for Performance at the Tipping Point	<i>New England Journal of Medicine</i> . 2007. Feb 1;356(5):515-7.
Farquhar, CM; Kofa, EW; Slutsky, JR	Clinicians' attitudes to clinical practice guidelines: a systematic review	<i>The Medical Journal of Australia</i> . 2002. Nov 4;177(9):502-6.
Gabbay, J; le May, A	Evidence based guidelines or collectively constructed "mindlines?" Ethnographic study of knowledge management in primary care	<i>British Medical Journal</i> . 2004. Oct 30;329(7473):1013.
Garfield, FB; Garfield, JM	Clinical Judgment and Clinical Practice Guidelines	<i>International Journal of Technology Assessment in Health Care</i> . 2000. Autumn;16(4):1050-60.
Glickman, SW; Ou, F; DeLong, ER; Roe, MT; Lytle, BL; Mulgund, J; Rumsfeld, JS; Gibler, WB; Ohman, EM; Schulman, KA; Peterson, ED	Pay for Performance, Quality of Care, and Outcomes in Acute Myocardial Infarction	<i>The Journal of the American Medical Association</i> . 2007. Jun 6;297(21):2373-80.
Grimshaw, JM; Eccles, MP	Is evidence-based implementation of evidence-based care possible?	<i>The Medical Journal of Australia</i> . 2004. Mar 15;180(6 Suppl):S50-1.
Grol, R; Dalhuijsen, J; Thomas, S; Veld, C; Rutten, G; Mokkink, H	Attributes of clinical guidelines that influence use of guidelines in general practice: observational study	<i>British Medical Journal</i> . 1998. Sep 26;317(7162):858-61.

Author	Title	Citation
Grol, R; Dalhuijsen, J; Thomas, S; Veld, C; Rutten, G; Mokka, H	Attributes of clinical guidelines that influence use of guidelines in general practice: observational study	<i>British Medical Journal</i> . 1998. Sep 26;317(7162):858-61.
Grol, R; Wensing, M	What drives change? Barriers to and incentives for achieving evidence-based practice	<i>The Medical Journal of Australia</i> . 2004. Mar 15;180(6 Suppl):S57-60.
Grossman, JM; Reed, M	Clinical Information Technology Gaps Persist Among Physicians	<i>Center for Studying Health System Change</i> . Issue Brief No. 106. 2006. Nov;(106):1-4
Halm, EA; Atlas, SJ; Borowsky, LH; Benzer, TI; Metlay, JP; Chang, Y; Singer, DE	Understanding Physician Adherence With a Pneumonia Practice Guideline: Effects of Patient, System, and Physician Factors	<i>Archives of Internal Medicine</i> . 2000.160:98-104.
Henderson, AJ; Davies, J; Willet, MR	The experience of Australian project leaders in encouraging practitioners to adopt research evidence in their clinical practice	<i>Australian Health Review</i> . 2006. November;30(4)
Henning, JM	The Role of Clinical Practice Guidelines in Disease Management	<i>The American Journal of Managed Care</i> . 1998. Dec;4(12):1715-22
Institute of Medicine	Roundtable on Evidence-Based Medicine	Institute of Medicine, Roundtable Members' Meeting 1, March 28, 2006
Jaffee, KD; Epling, JW; Grant, W; Ghandour, RM; Callendar, E	Physician-Identified Barriers to Intimate Partner Violence Screening	<i>Journal of Women's Health</i> . 2005. Oct;14(8):713-20.
Jamtvedt, G; Young, JM; Kristoffersen, DT; O'Brien, MA; Oxman, AD	Audit and feedback: effects on professional practice and health care outcomes (Review)	<i>Cochrane Database of Systematic Reviews</i> 2006, Issue 2

Author	Title	Citation
Jiang, HJ; Lagasse, RS; Ciccone, K; Jakubowski, MS; Kitain, EM	Factors Influencing Hospital Implementation of Acute Pain Management Practice Guidelines	<i>Journal of Clinical Anesthesia</i> . 2001. Jun;13(4):268-76.
Larson, E	Status of practice guidelines in the United States: CDC guidelines as an example	<i>Preventive Medicine</i> . 2003. May;36(5):519-24.
Lindenauer, PK; Remus, D; Roma, S; Rothberg, MB; Benjamin, EM; Ma, A; Bratzler, DW	Public Reporting and Pay for Performance in Hospital Quality Improvement	<i>New England Journal of Medicine</i> . 2007. Feb 1;356(5):486-96.
Luck, J; Peabody, JW; Dresselhaus, TR; Lee, M; Glassman, P	How Well Does Chart Abstraction Measure Quality? A Prospective Comparison of Standardized Patients with the Medical Record	<i>The American Journal of Medicine</i> . 2000. June 1;108(8):642-9.
Marshall, DA; Simpson, KN; Norton, EC; Biddle, AK; Youle, M	Measuring the Effect of Clinical Guidelines on Patient Outcomes	<i>International Journal of Technology Assessment in Health Care</i> . 2000. Autumn;16(4):1013-23.
Maue, SK; Segal, R; Kimberlin, CL; Lipowski, EE	Predicting Physician Guideline Compliance: An Assessment of Motivators and Perceived Barriers	<i>The American Journal of Managed Care</i> . 2004. Jun;10(6):383-91.
McGlynn, EA; Asch, SM; Adams, J; Keeseey, J; Hicks, J; DeCristofaro, A; Kerr, EA	The Quality of Health Care Delivered to Adults in the United States	<i>New England Journal of Medicine</i> . 2003. June 26;348(26):2635-45.
Mehta, NB	The doctors' challenge: How can we follow guidelines better?	<i>Cleveland Civic Journal of Medicine</i> . 2004. Feb;71(2):81-2, 85.
Metfessel, BA	An automated tool for an analysis of compliance to evidence-based clinical guidelines	<i>International Journal of Medical Informatics</i> 200. 110(Pt 1):226-30.
Michie, S; Lester, K	Words matter: increasing the implementation of clinical guidelines	<i>Quality and Safety in Health Care</i> . 2005. Oct;14(5):367-70.



Author	Title	Citation
Mittman, BS	Improving the Quality of Dementia Care: The Role of Education	<i>Clinical Gerontologist</i> . 2005. 29(2):61-69.
Mottur-Pilson, C; Snow, V; Bartlett, K	Physician Explanations for Failing To Comply with "Best Practices"	<i>Effective Clinical Practice</i> . 2001. Sep-Oct;4(5):207-13.
Natsch, S; van der Meer, JW	The role of clinical guidelines, policies and stewardship	<i>Journal of Hospital Infection</i> . 2003. Mar;53(3):172-6.
Newhouse, JP	A Model of Physician Pricing	<i>Southern Economic Journal</i> . 1970. 37(2):174-183.
Nutting, PA; Dickinson, WP; Dickinson, LM; Nelson, CC; King, DK; Crabtree, BF; Glasgow, RE	Use of Chronic Care Model Elements Is Associated With Higher-Quality Care for Diabetes	<i>Annals of Family Medicine</i> . 2007. Jan-Feb;5(1):14-20.
O'Brien, JA Jr; Jacobs, LM.; Pierce, D	Clinical Practice Guidelines and the Cost of Care: A Growing Alliance	<i>International Journal of Technology Assessment in Health Care</i> . 2000. Autumn;16(4):1077-91.
Olsen, L; Aisner, D; McGinnis, JM	The Learning Healthcare System: Workshop Summary (IOM Roundtable on Evidence-Based Medicine)	Institute of Medicine, April 2007
Pathman, DE; Konrad, TR; Freed, GL; Freeman, VA; Koch, GG	The Awareness-to-Adherence Model of the Steps to Clinical Guideline Compliance: The Case of Pediatric Vaccine Recommendations	<i>Medical Care</i> . 1996. Sep;34(9):873-89.
Pathman, DE; Konrad, TR; Freed, GL; Freeman, VA; Koch, GG	The Awareness-to-Adherence Model of the Steps to Clinical Guideline Compliance: The Case of Pediatric Vaccine Recommendations	<i>Medical Care</i> . 1996. Sep;34(9):873-89.
Performance Measurement Workgroup, Ambulatory Care Quality Alliance	AQA Parameters for Selecting Measures for Physician Performance, Version 3	Ambulatory Care Quality Alliance, Parameters for Selecting Measures for Physician Performance, Version 3

Author	Title	Citation
Phillips, LS; Branch Jr., WT; Cook, CB; Doyle, JP; El-Kebbi, IM; Gallina, DL; Miller, CD; Ziemer, DC; Barnes, CS	Clinical Inertia	<i>Annals of Internal Medicine</i> . 2001. Nov 6;135(9):825-34.
Prochaska, JO; DiClemente, CC	Stages and Processes of Self-Change of Smoking: Toward an Integrative Model of Change	<i>Journal of Consulting and Clinical Psychology</i> . 1983. Jun;51(3):390-5.
Puffer, S; Rashidian, A	Practice nurses' intentions to use clinical guidelines	<i>Journal of Advanced Nursing</i> . 2004. Sep;47(5):500-9.
Reilly, BM	The essence of EBM	<i>British Medical Journal</i> . 2004. Oct 30;329(7473):991-2.
Richman, R; Lancaster, DR	The Clinical Guideline Process Within A Managed Care Organization	<i>International Journal of Technology Assessment in Health Care</i> . 2000. Autumn;16(4):1061-76.
Robinson, JS; Turnbull, DA	Changing healthcare organisations to change clinical performance	<i>The Medical Journal of Australia</i> . 2004. Mar 15;180(6 Suppl):S61-2.
Rosenthal, MB; Dudley, RA	Pay-for-Performance: Will the Latest Payment Trend Improve Care?	<i>The Journal of the American Medical Association</i> . 2007. Feb 21;297(7):740-4.
Russo, JE; Schoemaker, PJ	Managing Overconfidence	<i>Sloan Management Review</i> . 1992. Winter;33(2):7-17.
Sanson-Fisher, RW	Diffusion of innovation theory for clinical change	<i>The Medical Journal of Australia</i> . 2004. Mar 15;180(6 Suppl):S55-6.
Schneider, JE; Peterson, NA; Vaughn, TE; Mooss, EN; Doebbeling, BN	Clinical practice guidelines and organizational adaptation: A framework for analyzing economic effects	<i>International Journal of Technology Assessment in Health Care</i> . 2006. Winter;22(1):58-66.

Author	Title	Citation
Shiffman, RN; Dixon, J; Brand, C; Essaihi, A; Hsiao, A; Michel, G; O'Connell, R	The GuideLine Implementability Appraisal (GLIA): development of an instrument to identify obstacles to guideline implementation	<i>BMC Medical Informatics and Decision Making</i> . 2005. Jul 27;5:23
Sprague, L	Quality in the Making: Perspectives on Programs and Progress	<i>National Health Policy Forum</i> . April 2001
Steinbrook, R	Guidance for Guidelines	<i>New England Journal of Medicine</i> . 2007. Jan 25;356(4):331-3.
Stone, TT; Schweikhart, SB; Mantese, A; Sonnad, SS	Guideline Attribute and Implementation Preferences Among Physicians in Multiple Health Systems	<i>Quality Management in Health Care</i> . 2005. Jul-Sep;14(3):177-87.
Straus, SE; Jones, G	What has evidence based medicine done for us?	<i>British Medical Journal</i> . 2004. October;329:987-988
Sweet, M	Development of strategies to encourage adoption of best evidence into practice in Australia: workshop overview	<i>The Medical Journal of Australia</i> . 2004. Mar 15;180(6 Suppl):S45-7.
Tan, KB	Clinical practice guidelines: a critical review	<i>International Journal of Health Care Quality Assurance</i> . 2006. 19(2-3):195-220.
Teich, JM; Osheroff, JA; Pifer, EA; Sittig, DF; Jenders, RA; The CDS Expert Review Panel	Chapter 1: Identifying Stakeholders and Goals	<i>Improving Outcomes with Clinical Decision Support: An Implementer's Guide</i> . 2005
Teich, JM; Osheroff, JA; Pifer, EA; Sittig, DF; Jenders, RA; The CDS Expert Review Panel	Clinical Decision Support in Electronic Prescribing: Recommendations and an Action Plan: Report of the Joint Clinical Decision Support Workgroup	<i>Journal of the American Medical Informatics Association</i> . 2005. Jul-Aug;12(4):365-76.

Author	Title	Citation
The AGREE Collaboration	Development and validation of an international appraisal instrument for assessing the quality of clinical practice guidelines: the AGREE project	<i>Quality and Safety in Health Care</i> . 2003. Feb;12(1):18-23.
Thornton, J; Eakin, BK	The Utility-Maximizing Self-Employed Physician	<i>The Journal of Human Resources</i> . 1997. Winter;32(1): 98-128.
Tunis, SR; Hayward, RS; Wilson, MC; Rubin, DR; Bass, EB; Johnston, M; Steinberg, EP	Internists' Attitudes about Clinical Practice Guidelines	<i>Annals of Internal Medicine</i> . 1994. Jun 1;120(11):956-63.
Ward, MM; Vaughn, TE; Uden-Holman, T; Doebbeling, BN; Clarke, WR; Woolson, RF	Physician knowledge, attitudes and practices regarding a widely implemented guideline	<i>Journal of Evaluation in Clinical Practice</i> . 2002. May;8(2):155-62.
Williams, JG; Cheung, WY; Price, DE; Tansey, R; Russell, IT; Duane, PD; Al-Ismael, SA; Wani, MA	Clinical guidelines online: do they improve compliance?	<i>Postgraduate Medical Journal</i> . 2004. Jul;80(945):415-9.
Wolff, M; Bower, DJ; Marbella, AM; Casanova, JE	US Family Physicians' Experiences With Practice Guidelines	<i>Family Medicine</i> . 1998. Feb;30(2):117-21.
Woolf, SH; Grol, R; Hutchinson, A; Eccles, M; Grimshaw, J	Potential benefits, limitations, and harms of clinical guidelines	<i>British Medical Journal</i> . 1999. Feb 20;318(7182):527-30.

## Appendix B: Key Informants

<b>Key Informant</b>	<b>Title</b>	<b>Organization</b>
David Blumenthal, MD, MPP	Director and Professor	Institute for Health Policy, Massachusetts General Hospital, Harvard Medical School
Greg Dorn, MD, MPH	General Manager	Zynx Health
Roberta Herman, MD	Chief Medical Officer and Senior Vice President of Health Services	Harvard Pilgrim Health Care
Paul Keckley, PhD	Executive Director	Vanderbilt Center for Evidence-based Medicine
David Nash, MD, MBA, FACP	The Dr. Raymond C. & Doris N. Grandon Professor & Chair, Department of Health Policy	Jefferson Medical College
Richard Platt, MD	Professor of Ambulatory Care and Prevention, Professor of Medicine	Harvard Medical School
J. Edward Russo, PhD	Professor	Cornell University
James M. Schibanoff, MD	Editor-in-Chief	Milliman Care Guidelines
John Simmons, PhD	Commonwealth Professor of Philosophy and Professor of Law	University of Virginia
Johnathan Teich, MD, PhD	Chief Medical Informatics Officer	Elsevier
George Isham, MD, MS	Chief Health Officer and Plan Medical Director	HealthPartners
Gary Oftedahl, MD	Medical Director	Institute for Clinical Systems Improvement
Sherrie Dulworth, RN	Director of Strategic Planning and Development	Milliman Care Guidelines
Brian Mittman, PhD	Senior Social Scientist	Veteran's Administration/ UCLA/RAND Center for the Study of Healthcare Provider Behavior
Jeff Hanson	Vice President	Thompson Healthcare – Medstat

## Appendix C: Harris Interactive Survey

# Healthcare News

EDITOR

Humphrey Taylor  
Chairman of *The Harris Poll*®

 **HarrisInteractive**  
HEALTHCARE RESEARCH  
*The Harris Poll*® PEOPLE

8 Volume  
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### Physicians' Use of Clinical Guidelines – and How to Increase it.

*Most physicians do not use guidelines consistently but could be influenced to do so.*

Harris Interactive recently conducted a survey of practicing physicians for the New England Healthcare Institute on their use and non-use of clinical guidelines with a special focus on how their use of guidelines might be increased. According to the study, the use of clinical guidelines is still not standard practice with many physicians and the survey findings strongly suggest several different ways that would increase guideline use substantially.

Those who do routinely use guidelines are most likely to be physicians considering treatment in a hospital or inpatient setting. Physicians' general views on clinical guidelines are mixed, and such factors as time involved to find or implement appropriate guidelines, and lack of awareness of relevant guidelines are cited as the most common impediments to their use.

However, opportunities do exist to greatly increase the awareness and usage of clinical guidelines. According to these findings, both greater awareness and communication of guidelines, and increased financial incentives would positively impact guideline use by physicians. The study shows that financial incentives are a strong motivator of behavior change when it comes to consistently using clinical guidelines.

It is also significant to note the variability in usage by specialty. The majority of cardiologists are much more likely to routinely use clinical guidelines than are primary care physicians or other specialties. Orthopedists are much less inclined to use guidelines unless patient safety is a significant element of their decision.

The survey is based on a nationwide sample of 231 practicing physicians who were surveyed online between April and May, 2007. The sample included oversamples of orthopedists and cardiologists but the data was weighted to provide a nationwide cross-section of all practicing physicians. In total Harris Interactive interviewed 78 primary care physicians, 50 Cardiologists, 50 Orthopedists and 53 other specialists.

#### Use and Non-use of Guidelines

Most practicing physicians do not use clinical guidelines "in most cases." However a substantial 44 percent claim to do so "consistently" and most others are either "planning" to do so (12%) or are "considering" using them (26%).

About a quarter (27%) of all practicing physicians claims to use guidelines three times a day or more often. A further 27 percent report using them between 4 and 11 times a week.

Among those who use guidelines the most frequent situations in which they use them are when considering treatments in hospital settings (80%), when counseling patients in preventive care (66%), when considering treatments in outpatient settings (62%) and in diagnosis (53%).

The reasons given most often for not using guidelines are that the diagnosis was not clear (48%), the belief (accurate or inaccurate) that there were no relevant guidelines (44%), the inconvenience of using them (37%) and disagreement with the guidelines (33%).

**Table 1**  
**Current Use and Possible Future Use of Guidelines**

“Physicians sometimes find it difficult to follow clinical guidelines for most cases. For most cases means consistently taking the steps described in clinical guidelines. Please find the statement that best describes the way you feel right now about using clinical guidelines for most cases.”

Base: All Practicing MDs

	Total
	%
No, I do not use and right now am not considering using clinical guidelines for most cases.	18
No, I do not use but right now am considering using clinical guidelines for most cases.	26
No, I do not use but right now am planning to start using clinical guidelines for most cases.	12
Yes, right now I consistently use clinical guidelines for most cases.	44

**Table 2**  
**Frequency of Using Clinical Guidelines**

“How often do you use clinical guidelines when treating patients?”

Base: All Practicing MDs

	Total
	%
Never	4
Less than once a week	14
2-3 times a week	29
4-6 times a week	16
7-11 times a week	11
3-4 times a day	12
5-6 times a day	5
More than 6 times a day	10
“Frequent Users” ( 3 times a day or more often)	27

**Table 3**  
**Those Who Often Use Guidelines in Four Different Situations**  
“How often do you use clinical guidelines in the following situations? (Often/Always)”

Base: Those Who Use Guidelines

	Total
	%
When considering treatments in an inpatient/hospital setting	80
When counseling patients on preventative care	66
When considering treatments in an outpatient/office setting	62
When diagnosing patients (including reviewing test results or diagnostics)	53

**Table 4**  
**Most Common Reasons for Not Using Guidelines**  
“When you have not used clinical guidelines in the past what were your reasons for not using them?”

Base: All Practicing MDs

	Total
	%
The diagnosis was not completely determined	48
I was not aware of any relevant clinical guidelines	44
It was not convenient	37
I did not agree with them	33
I did not think they would produce the desired outcome	29
My office did not have the technology to properly implement them	23
I was not being reimbursed for activities related to guideline implementation	20
They conflicted with how I currently practice medicine	18

### Attitudes to Guidelines

The level of knowledge of guidelines varies widely. About a third (35%) of practicing physicians describe themselves as extremely or very knowledgeable, but another third (36%) describe themselves as only somewhat or not very knowledgeable.

However – and in apparent contradiction with some of the other replies given in the survey – fully 72 percent of practicing physicians claim that clinical guidelines have a strong influence on their choice of therapy.

Personal experience (89%) tops the list of factors determining therapies, ahead of clinical guidelines, peer-reviewed journals (67%) and formal education (58%).



Many physicians hold both positive and negative views of the use of guidelines. On the one hand most physicians believe they improve clinical outcomes (67%) and lead to appropriate utilization of services by their patients (63%). However a quarter of physicians believe that guidelines undermine their autonomy (25%), that they are rarely helpful (23%), that their own experience and training is more useful (26%) or that guidelines are too broad to be implemented as a standard approach (30%).

Ease of use and the time involved are clearly big issues. Most physicians believed they would be less likely to use them “if they required more effort” (68%) to find them or to access them. A third (32%) believes they would use guidelines more often if they had the time. Looking forward to the next three to five years, most physicians (67%) believe clinical guidelines will have a strong influence on their clinical decision-making, with even more (77%) mentioning evidence-based medicine.

**Table 5**  
**Knowledge of Guidelines**  
“How knowledgeable are you about clinical guidelines?”

Base: All Practicing MDs

	Total
	%
Extremely/Very knowledgeable	35
Extremely knowledgeable	9
Very knowledgeable	26
Knowledgeable	29
Somewhat/not very knowledgeable	36
Somewhat knowledgeable	34
Not very knowledgeable	2

**Table 6**  
**Factors With Strong Influence on Therapy Decisions**  
“When deciding on a course of therapy, how much influence does each of the following factors have on your final decision?”

Base: All Practicing MDs

	Total
	%
Personal experience	89
<b>Clinical guidelines</b>	<b>72</b>
Peer reviewed journals	67
Formal education (i.e., medical school)	58
Discussion with peers	56
Residency training	55
Witnessing others doing it	27
Detailing from Sales Representatives	8

**Table 7**  
**Attitudes to Guidelines: Those Who Agree With 14 Statements**  
“How much do you agree or disagree with the following statements?”  
*Agree strongly or somewhat*

Base: All Practicing MDs

	Total
	%
I would be less likely to use clinical guidelines if they required more effort for me to find them	68
I would be less likely to use clinical guidelines if they required more effort for me to access them at the time they are needed	68
Guidelines improve clinical outcomes for my patients	67
Guidelines lead to appropriate utilization of healthcare services by my patients	63
I would be less likely to use clinical guidelines if they required more effort for me to read them	52
I believe that experimenting with treatments other than what is in clinical guidelines can lead to innovation	49
Guidelines increase efficiency and save money	49
It would make me feel more empowered if I could order medical services different than what's in the clinical guidelines	41
I would use guidelines more often if I had time	32
Guidelines are too broad to be implemented as a standard approach	30
My own experience and training will yield better outcomes for my patients than guidelines would	26
Guidelines undermine my own autonomy as a physician	25
Guidelines are rarely helpful because each patient or situation is different	23
I tend to use guidelines because my past experience with them did not help my patients	18

**Table 8**  
**Factors Likely to Have a Strong Influence on Therapy in Next 3 to 5 Years**  
“How much influence do you think each of the following trends will have on your clinical decision-making in the next 3 to 5 years?”  
*Strong or very strong influence*

Base: All Practicing MDs

	Total
	%
Evidence-based medicine	77
<b>Clinical guidelines</b>	<b>67</b>
Health Information Technology	54
Changes in reimbursement practices	39
Pay-for-performance incentives from payers	26
Consumer-directed healthcare	17

## Factors Likely to Increase Use of Guidelines

The survey findings provide many suggestions for factors which advocates of the greater use of guidelines might use. In many cases these relate to how guidelines are communicated to physicians. Large majorities believe they would be more likely to use them if they “are relevant to the way I practice medicine” (88%), if they were “written by credible sources” (82%), used “sound methodology” (79%), were “independent of commercial interests” (77%) and were “highly recommended” (71%). In so far as guidelines already satisfy these requirements – as many of them surely do – these responses strongly suggest the need for greatly improved communications with physicians about how guidelines are developed and approved.

As regards actual changes in how guidelines are communicated, half of all practicing physicians believe they would be more likely to use guidelines if they were incorporated in their order entry systems.

As regards the guidelines themselves, fully 83 percent of physicians believe they would follow guidelines for a specific therapy when evidence is shown comparing different therapies. Other factors which would encourage greater use include information on the safety of recommended therapies (61%), or when the cost of recommended therapies are significant elements of their decisions (45%).

**Table 9**  
**Factors Which Would be Likely to Increase Use of Guidelines**

“Would you be any more likely to use clinical guidelines if the following were true?”  
*More/much more likely to use*

Base: All Practicing MDs

	Total
	%
The findings are relevant to the way I practice medicine	88
It was written by credible sources	82
It has a sound methodology (e.g. risk adjusted)	79
It is considered independent of commercial interests	77
It is highly recommended	71
The approach is shown to be cost effective	67

**Table 10**  
**Factors Which Would Increase Use of Guidelines**

"Would you be any more likely to use clinical guidelines if they were communicated to you in the following manner?"  
*Much more, or more likely*

Base: All Practicing MDs

	Total
	%
On a physician order entry system	50
Published journal	43
Hard copy/paper	38
A customized email	31

**Table 11**  
**Likelihood of Following Guidelines in Six Circumstances**

"How likely would you be to follow clinical guidelines that recommend a specific medication therapy?"  
*Very or somewhat likely*

Base: All Practicing MDs

	Total
	%
When evidence is shown comparing the recommended medication therapy to other options	83
When safety of the recommended medication therapy is a significant element of the decision	61
When costs of the recommended medication therapy are a significant element of the decision	45
When it involves a patient registry to track and manage patients on the recommended medication therapy	34
When it is unclear if the recommended medication therapy is cost effective	22
When the recommended medication therapy conflicts with my current practice	15

## Impact of Public and Patient Access to Information on Physicians Compliance with Guidelines

Some physicians believe that if reports on their compliance with guidelines were available to the public, they would be much more likely (14%) or somewhat more likely (36%) to use them.

Similar percentages believe that patient access to their compliance reports would increase their compliance.

**Table 12**  
**Impact on Use of Public Access to Reports on Physician Compliance**

"To what extent, if at all, would reports of your compliance with clinical guidelines accessible on the internet by everyone increase your likelihood to consistently use clinical guidelines?"

Base: All Practicing MDs

	Total
	%
Much more likely	14
Somewhat more likely	36
Slightly more likely	26
No more likely	24

**Table 13**  
**Impact on Use of Patients' Access to Reports on Physician Compliance**

"To what extent, if at all, would reports of your compliance with clinical guidelines accessible by patients increase your likelihood to consistently use clinical guidelines?"

Base: All Practicing MDs

	Total
	%
Much more likely	12
Somewhat more likely	33
Slightly more likely	25
No more likely	30

## Potential Impact of Time and Incentives on Guidelines Use

Pay for Performance (P4P) is a hot topic these days. The results of this survey strongly suggest that financial incentives to physicians who follow guidelines could have a substantial impact. On the other hand a major disincentive is if it takes more time to follow guidelines (as shown in Table 7). The survey shows that as the size of the incentive increases – from 2 percent to 9 percent to 20 percent – so utilization is likely to grow rapidly even where it takes ten minutes longer to use them.

It would of course be surprising if this were not the case. Physicians, as a group, respond to economic incentives just like every other group.

**Table 14**  
**Impact on Guideline Use if it Added Ten Minutes More Time and 2% Higher Reimbursement**

"If complying with a clinical guideline for Medicare patients required an additional 10 minutes of work per patient on the part of you or your staff, to what extent would a 2% of total Medicare reimbursement bonus for being compliant with the clinical guideline increase your likelihood to consistently use it?"

Base: All Practicing MDs

	Total
	%
Much more likely	5
Somewhat more likely	14
Slightly more likely	32
No more likely	49

**Table 15**  
**Impact on Guideline Use if it Added Ten Minutes More Time and 9% Higher Reimbursement**

"If complying with a clinical guideline for Medicare patients required an additional 10 minutes of work per patient on the part of you or your staff, to what extent would a 9% of total Medicare reimbursement bonus for being compliant with the clinical guideline increase your likelihood to consistently use it?"

Base: All Practicing MDs

	Total
	%
Much more likely	16
Somewhat more likely	35
Slightly more likely	36
No more likely	13

**Table 16**  
**Impact on Guideline Use if it Added Ten Minutes More Time and 20% Higher Reimbursement**

"If complying with a clinical guideline for Medicare patients required an additional 10 minutes of work per patient on the part of you or your staff, to what extent would a 20% of total Medicare reimbursement bonus for being compliant with the clinical guideline increase your likelihood to consistently use it?"

Base: All Practicing MDs

	Total
	%
Much more likely	48
Somewhat more likely	33
Slightly more likely	15
No more likely	4

### Differences by Specialists

The survey allows for a comparison between primary care physicians and specialists and, because of oversampling of orthopedists and cardiologists. **Cardiologists are found to be much more likely to use guidelines than other specialists and than primary care physicians. Orthopedists are much less likely to use them.**

No doubt there are strong reasons in the differences between their practices to explain these differences. However even though they are less frequent users of guidelines, most orthopedists refer positively to the use of guidelines and the likelihood of following them when safety is a significant element of their decision making.

**Table 17**  
**Some Differences by Specialty**

	All MDs	Primary Care	Orthopedists	Cardiologists	Other Specialists
	%	%	%	%	%
Consistently use guidelines for most cases	44	47	25	70	34
Frequent use of clinical guidelines (3 times a day or more often)	27	31	23	47	12
Knowledge of clinical guidelines (extremely/very knowledgeable)	35	28	19	48	45
Influence of clinical guidelines (very strong or strong)	72	77	67	78	63
Likelihood of following clinical guidelines when safety of recommended medication is a significant element of decision (very or somewhat likely)	61	59	73	67	58
Inclusion of clinical guidelines on a physician order entry system would be likely to increase use	50	51	44	40	56
Increased likelihood of use of guidelines if patients have access to reports of your compliance	45	38	39	52	52

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## Methodology

- This survey was conducted online among primary care physicians and specialists.
- Physician sample was obtained through the Harris Interactive physician panel. Survey duration was 20 minutes.
- A qualified respondent was currently: in practice for at least 2 years, works in an office or clinic, not affiliated with an integrated health system and is either a specialist (Cardiologist, Gastroenterologist, General Surgeon, Neurologist, Oncologist, Orthopedist, Rheumatologist, or Urologist) or a primary care physician (Family Practice/General Practice/Internal Medicine).
- A total of 231 interviews were conducted for this report:
  - 78 Primary Care Physicians (Family Practice/General Practice/Internal Medicine)
  - 50 Orthopedists
  - 50 Cardiologists
  - 53 Other specialists: Gastroenterologist (19), General Surgeon (1), Neurologist (14), Oncologist (4), Rheumatologist (1), Urologist (14)

*These statements conform to the principles of disclosure of the National Council on Public Polls.*

The New England Healthcare Institute report “Improving Physician Adherence to Clinical Practice Guidelines: Barriers and Strategies for Change” is available on their web site – [www.nehi.net](http://www.nehi.net).

## About Harris Interactive

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## Appendix D: Harris Interactive Survey Methodology

### SAMPLE AND INTERVIEWING METHODS

This survey was conducted online among primary care physicians and specialists. The physician sample was obtained through the Harris Interactive physician panel. The survey duration was 20 minutes.

A qualified respondent was currently: in practice for at least 2 years, working in an office or clinic, not affiliated with an integrated health system and either a specialist (Cardiologist, Gastroenterologist, General Surgeon, Neurologist, Oncologist, Orthopedist, Rheumatologist, or Urologist) or a primary care physician (Family Practice/General Practice/Internal Medicine). A total of 231 interviews were conducted for this report. Of those 231 interviews, 78 were with Primary Care Physicians (Family Practice/General Practice/Internal Medicine), 50 were with Orthopedists, 50 were with Cardiologists, and 53 were with other specialists: Gastroenterologist (19), General Surgeon (1), Neurologist (14), Oncologist (4), Rheumatologist (1), Urologist (14). Radiologists, pathologists, and physicians who are employed by a hospital or large group practice were excluded from the survey.

Qualified Primary Care Physicians were offered a \$55 honorarium for their participation. Qualified Specialists were offered a \$75 honorarium for their participation. Interviews were conducted in April-May 2007.

### WEIGHTING AND SIGNIFICANCE TESTING

The data for this study were weighted to targets based on the nine physician specialties' universe in the AMA database. The data are weighted to targets in a way to reduce or eliminate biases that occur with survey taking. These biases may include: a demographic skew among those who answer the survey, a modal bias that can result in desirable responses by the respondents instead of true responses, and a potential selection bias that may result in attitudinal and behavioral skews in the data.

It is desirable to severely reduce or eliminate these biases in order to accurately project the data collected within the survey as representative of the total target population. Two sets of weight targets were created for weighting physicians – one set for PCP's and one set for specialists. All specialties were weighted to be projectable by gender, years in practice and geography. A post-weight was applied to the total aggregate to make sure that the nine specialties were included in their correct proportion (the correct proportion is determined based on the population of interest - the AMA database of physicians was used as the source). A profile is then created that matches that of a qualified respondent. The small sample size made weighting each specialty separately unfeasible. Significance testing was conducted at a 95% confidence level.

## Appendix E: Expert Panelists' Biographies

### MICHAEL CABANA, MD, MPH

Associate Professor of Pediatrics, Epidemiology and Biostatistics, Dr. Cabana is the Director of the Division of General Pediatrics at the University of California, San Francisco (UCSF). He is also a member of the core faculty at the Institute for Health Policy Studies. Dr. Cabana's research interests include understanding variation in physician practice as it relates to quality of care, particularly asthma. His work has focused on measurement of quality of care, physician use of clinical practice guidelines, primary care referrals to sub-specialists for asthma, as well as the primary prevention of asthma.

Dr. Cabana completed his undergraduate medical training through the combined program at the University of Pennsylvania School of Medicine and the Wharton School of Business, where he earned a Masters Degree in Public Policy and Management. Dr. Cabana trained in pediatrics at the Harriet Lane Service at the Johns Hopkins Children's Center. He continued at Johns Hopkins as a Robert Wood Johnson Clinical Scholar, where he completed a Masters in Public Health at the same institution. Dr. Cabana joined the faculty at the University of Michigan in 1999. In 2005, he joined the faculty at UCSF. Dr. Cabana is the co-Director of the Physician Asthma Care Education (PACE) Program. The PACE program was funded by Robert Wood Johnson Foundation to improve physician asthma counseling and communication. Dr. Cabana is currently the principal investigator for the Enhancing Pediatric Asthma Management Study (R-01 HL70771), a five year-study focused at improving physician management of pediatric asthma. He is also the principal investigator for the Trial of Infant Probiotic Supplementation (R-01 HL80074), a five-year randomized controlled trial to evaluate the effectiveness of probiotic supplementation in the prevention of early markers of asthma.

### GARY OFTEDAHL, MD

Dr. Oftedahl is the Medical Director of the Institute for Clinical Systems Improvement (ICSI) in Minneapolis. ICSI is a quality improvement collaborative of 61 medical organizations in Minnesota and its immediate bordering areas. Its purpose is to accelerate improvement in health care delivered by its members. In his role, Dr. Oftedahl works with many of the member organizations as a content expert and facilitator of ICSI collaborative efforts.

Dr. Oftedahl previously worked at the Olmstead Medical Center (OMC) in Rochester, Minnesota, serving as its Medical Director for Quality. Over 26 years at OMC, he was involved in multiple state and local organizations, including work with PRO, Blue Cross/Blue Shield of Minnesota, and served as the medical director of multiple nursing homes.

Dr. Oftedahl received his medical degree from the University of Wisconsin in Madison, Wisconsin, served an internal medicine residency at Gunderson Clinic/La Crosse Lutheran Hospital in La Crosse, Wisconsin, and is board certified in Internal Medicine.

JAMES M. SCHIBANOFF, MD

Dr. Schibanoff is the Editor-in-Chief of Milliman Care Guidelines and a principal in their San Diego office. His primary responsibilities include supervision of the editorial and peer review process, analysis of guideline evidence bases, management of expert clinician panels, developing new guidelines, and leading revision of existing guidelines. His duties involve representing Milliman Care Guidelines to regulatory agencies and medical specialty societies. Prior to joining Milliman, he served as the Chief Medical Officer of a health care system and Chief Executive Officer of two San Diego hospitals. He graduated from Princeton University and received his medical degree from USC Medical School. He completed an internal medicine residency and Pulmonary Disease fellowship at UC San Diego Medical Center.

DAN SOLOMON, MD, MPH

Dr. Solomon is an Associate Professor of Medicine at Harvard Medical School and a Rheumatologist in the Division of Pharmacoepidemiology and Pharmoeconomics. The focus of his research is health services research, quality of care, and pharmacoepidemiology as it pertains to rheumatic diseases and osteoporosis. Specific topics of interest include: Indicators of quality prescribing, patterns of medication use for osteoporosis, quality improvement in osteoporosis care, and cardiovascular disease in patients with rheumatoid arthritis. Dr. Solomon is Director of the Managed Care Sub-Committee of the Arthritis Foundation. He attended Yale College, Yale School of Medicine, and Harvard School of Public Health. His residency and fellowship training in rheumatology were completed at Brigham and Women's Hospital. As well, his clinical practice is at Brigham and Women's Hospital.

CHARLOTTE YEH, MD

Dr. Yeh is the Regional Administrator for the Boston and New York Regional Office for the Centers for Medicare and Medicaid Services (CMS). Dr. Yeh serves to promote the vital work performed by CMS in maintaining and improving the nation's health in New England and New York, New Jersey, Puerto Rico and the Virgin Islands. Dr. Yeh facilitates collaborative relationships between CMS and a variety of organizations to promote awareness of Medicare and Medicaid programs and to ensure that beneficiaries receive the benefits they deserve. In 2006, Dr. Yeh directed the implementation of the Medicare Prescription Drug Benefit, the single biggest expansion of the Medicare Program since its inception 40 years ago. As a result of the outreach activities and the grassroots partnership networks developed under her leadership, over 90 percent of all people in her regions with Medicare are covered by the benefit.

From 1998 until January 2003, Dr. Yeh served as the medical director for Medicare policy for National Heritage Insurance Company in Hingham, Massachusetts. Dr. Yeh brings over 20 years of active emergency medicine experience to her position, serving as the Physician-in-Chief of the Emergency Department at New England Medical Center, a major academic medical center in Boston. Previously, she served as a staff physician and Chief of the Department of Emergency Medicine at Newton-Wellesley Hospital, a community teaching hospital. Both institutions are affiliated with Tufts University School of Medicine

where Dr. Yeh held an appointment as Assistant Professor in the Department of Emergency Medicine.

Dr. Yeh received a bachelor's degree in 1971 from Northwestern University in Evanston, Illinois and her medical degree in 1975 from Northwestern University Medical School in Chicago. She completed her internship in general surgery at the University of Washington at Seattle and her residency in emergency medicine at the University of California at Los Angeles.

**BARRY G. ZALLEN, MD**

Dr. Zallen, the Medical Director, Provider Partnerships at Blue Cross Blue Shield of Massachusetts (BCBSMA), earned his B.A. in Biology at Brown University and his M.D. at Northwestern University Medical School. Dr. Zallen did his pediatric residency at Boston Floating Hospital and at Children's Hospital in Boston. He also completed a fellowship in General and Developmental Pediatrics at Children's Hospital.

Following faculty appointment at the University of Colorado School of Medicine, Dr. Zallen joined Harvard Community Health Plan (now Harvard Vanguard Medical Associates) as a pediatrician. He was a medical director for 10 years before joining BCBSMA in 2000.

Dr. Zallen's clinical interests include developmental and behavioral pediatrics and genomics. His responsibilities at BCBSMA include the development of evidence-based medicine incentive and safety programs as the basis for improving quality and reducing costs. He also leads BCBSMA efforts related to pediatrics.

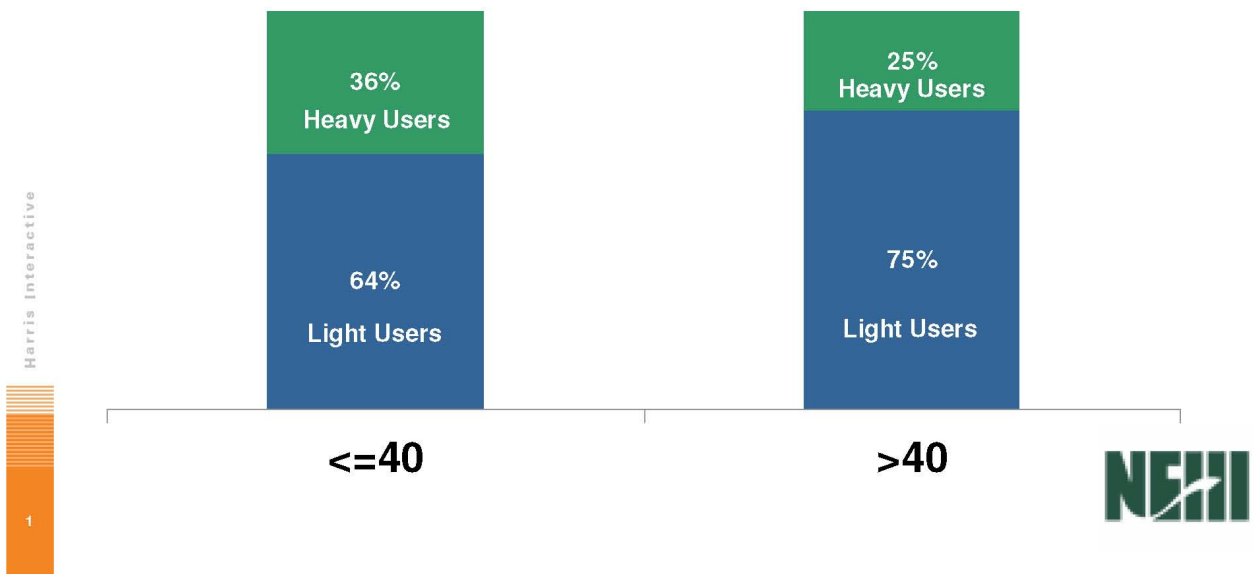
## Appendix F: Figures of Key Findings

**Guideline use does not vary much between younger and older physicians.**

**Figure 1**

STRATEGIC HEALTH PERSPECTIVES

**Light vs. Heavy Users of Clinical Guidelines by Age**

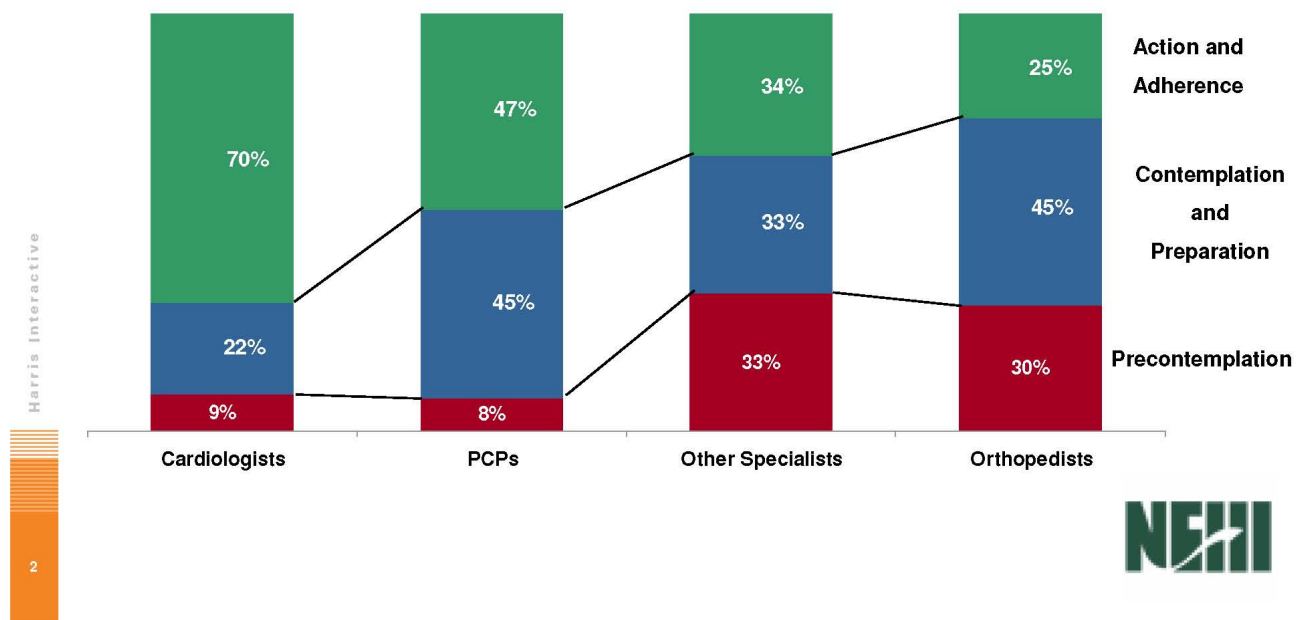


## Cardiologists are further along with adopting guidelines than other types of physicians.

## Figure 2

STRATEGIC HEALTH PERSPECTIVES

### Stages of Adoption by Specialty

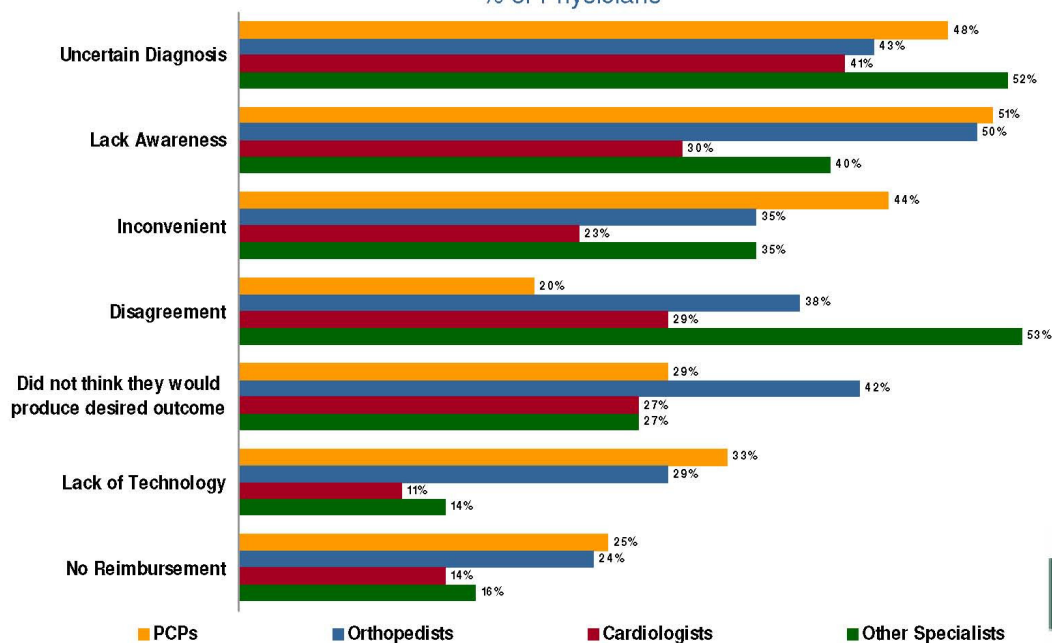


By specialty, Cardiologists are less likely to encounter barriers.

Figure 3

STRATEGIC HEALTH PERSPECTIVES

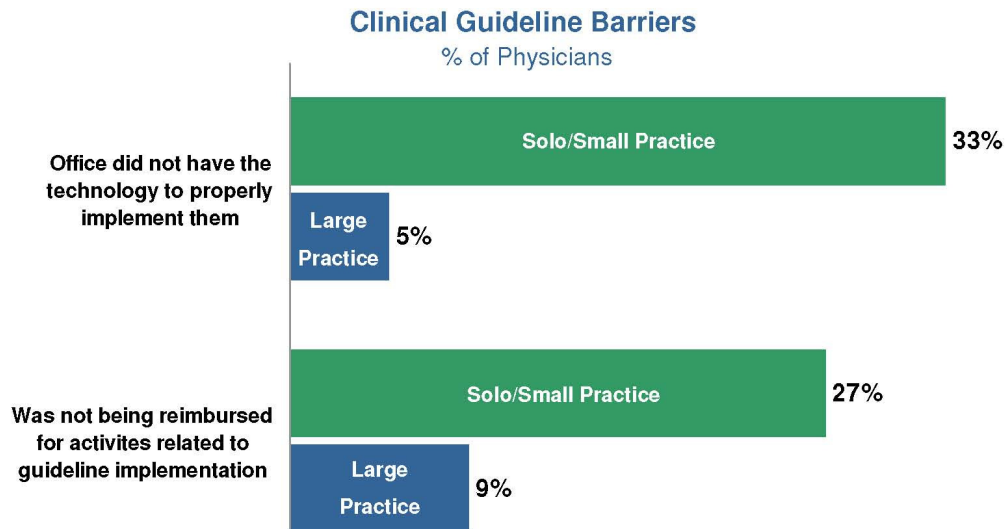
Clinical Guideline Barriers  
% of Physicians



**IT and reimbursement barriers are more important for small and solo practices compared to large practices.**

**Figure 4**

STRATEGIC HEALTH PERSPECTIVES



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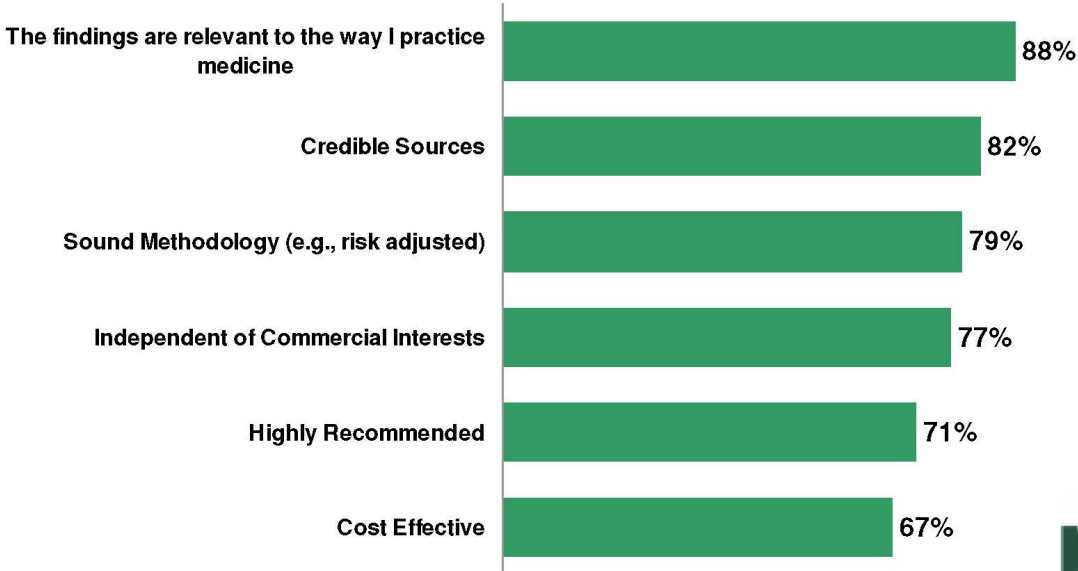


Relevance to physician practice is a more important attribute of clinical guidelines than cost effectiveness.

Figure 5

STRATEGIC HEALTH PERSPECTIVES

Criteria for Effective Clinical Guidelines  
More likely/Much more likely



Harris Interactive

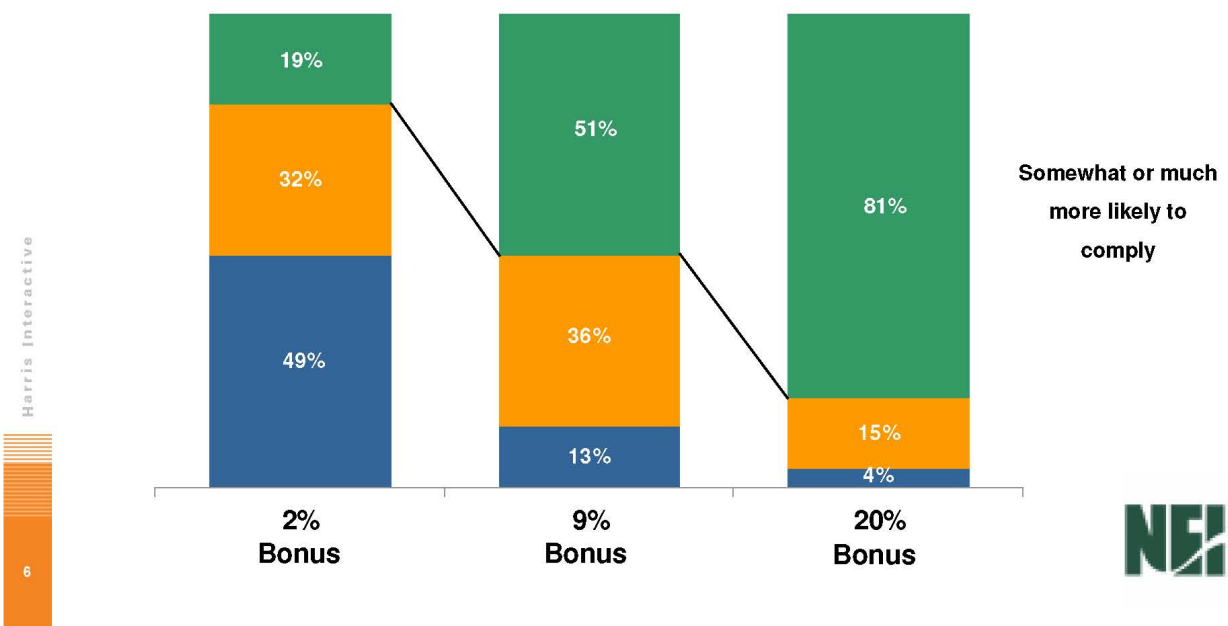
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## Money matters for increasing adherence.

## Figure 6

STRATEGIC HEALTH PERSPECTIVES

### Likelihood of Compliance with Guidelines by Bonus Level



## Endnotes

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- <sup>1</sup> McGlynn, EA, Asch, SM, Adams, J, Keeseey, J, Hicks, J, DeCristofaro, A, Kerr, EA. The Quality of Health Care Delivered to Adults in the United States, *New England Journal of Medicine*. Vol. 348, No. 26, June 26, 2003
- <sup>2</sup> Nutting, PA, Dickinson, WP, Dickinson, LM, Nelson, CC, King, DK, Crabtree, BF, Glasgow, RE. Use of Chronic Care Model Elements Is Associated With Higher-Quality Care for Diabetes, *Annals of Family Medicine*. Volume 5, No. 1, January/February 2007
- <sup>3</sup> Farquhar, CM, Kofa, EW, Slutsky, JR. Clinicians' attitudes to clinical practice guidelines: a systematic review. *MJA*. Volume 177, November 4, 2002
- <sup>4</sup> Grol, R, Wensing, M. What drives change? Barriers to and incentives for achieving evidence-based practice. *MJA*. Volume 180, March 15, 2004
- <sup>5</sup> Mehta, NB. The doctors' challenge: How can we follow guidelines better? *Cleveland Civic Journal of Medicine*. Volume 71, No. 2, February 2004
- <sup>6</sup> IOM, Roundtable on Evidence-Based Medicine, Institute of Medicine, 2006
- <sup>7</sup> Rosenthal, MB, Dudley, RA. Pay-for-Performance: Will the Latest Payment Trend Improve Care? *The Journal of the American Medical Association*. Volume 297, No. 7, February 21, 2007
- <sup>8</sup> Mehta, NB. The doctors' challenge: How can we follow guidelines better? *Cleveland Civic Journal of Medicine*. Volume 71, No. 2, February 2004
- <sup>9</sup> Richman, R, Lancaster, DR. The Clinical Guideline Process Within A Managed Care Organization. *International Journal of Technology Assessment in Health Care*. 16:4 (2000), 1061-1076
- <sup>10</sup> IOM. Roundtable on Evidence-Based Medicine. Institute of Medicine, 2006
- <sup>11</sup> Wolff M, Bower DJ, Marbella AM, Casanova JE. U.S. Family Physicians' Experiences with Practice Guidelines. *Clinical Research Methods*, Vol. 30, No. 2, 1998, pp. 117-121.
- <sup>12</sup> Richman R, Lancaster DR. The Clinical Guideline Process within a Managed Care Organization. *International Journal of Technology Assessment in Health Care*. Vol. 16, No. 4, 2000, pp. 1061-1076.
- <sup>13</sup> Henderson AJ, Davies J, Willet MR. The Experience of Australian Project Leaders in Encouraging Practitioners to Adopt Research Evidence in Their Clinical Practice. *Australian Health Review*. Vol. 30, No. 4, November 2006, pp. 474-484.
- <sup>14</sup> Neil B. Mehta, MD, The doctors' challenge: How can we follow guidelines better? *Cleveland Civic Journal of Medicine*. Volume 71, No. 2, February 2004
- <sup>15</sup> Grossman JM, Reed MC. Clinical Information Technology Gaps Persist among Physicians. *Health System Change Issue Brief*. No. 106, November 2006, pp. 1-4.
- <sup>16</sup> Grossman JM, Reed MC. Clinical Information Technology Gaps Persist among Physicians. *Health System Change Issue Brief*. No. 106, November 2006, pp. 1-4.
- <sup>17</sup> Schneider JE, Peterson NA, Vaughn TE, Mooss EN, Doebbeling BN. Clinical Practice Guidelines and Organizational Adaptation: A Framework for Analyzing Economic Effects. *International Journal of Technology Assessment in Health Care*. Vol. 22, No. 1, 2006, pp. 58-66.
- <sup>18</sup> Teich JM, Osheroff, JA, Pifer EA, Sittig, DF, Jenders RA (The CDS Expert Review Panel). Clinical Decision Support in Electronic Prescribing: Recommendations and an Action Plan: Report of the Joint Clinical Decision Support Workgroup. *Journal of the American Medical Informatics Association*, Vol. 12, No. 4, July/August 2005, pp. 365-376.
- <sup>19</sup> Russo JE, Schoemaker PJH. Managing Overconfidence. *Sloan Management Review*. Winter 1992, pp. 7-17.
- <sup>20</sup> Jamtvedt G, Young JM, Kristoffersen DT, O'Brien MA, Oxman, AD. Audit and Feedback: Effects on Professional Practice and Health Care Outcomes. *Cochrane Database of Systematic Reviews*, Issue 4, 2006, pp. 1-83.
- <sup>21</sup> William JG, Cheung WY, Price DE, Tansey R, Russell IT, Duane PD, Al-Ismail SA, Wani MA. Clinical Guidelines Online: Do They Improve Adherence? *Postgraduate Medical Journal*. Vol. 80, 2004, pp. 415-419.
- <sup>22</sup> Steinbrook R. Guidance for Guidelines. *New England Journal of Medicine*. Vol. 356, No. 4, January 25, 2007, pp. 331-333.
- <sup>23</sup> Borkowski NM, Allen WR. Does Attribution Theory Explain Physicians' Non-acceptance of Clinical Practice Guidelines? *Hospital Topics*. Vol. 81, No. 2, Spring 2003, pp. 9-21.
- <sup>24</sup> Borkowski NM, Allen WR. Does Attribution Theory Explain Physicians' Non-acceptance of Clinical Practice Guidelines? *Hospital Topics*. Vol. 81, No. 2, Spring 2003, pp. 9-21.
- <sup>25</sup> O'Brien JA, Jacobs LM, Pierce D. Clinical Practice Guidelines and the Cost of Care: A Growing Alliance. *International Journal of Technology Assessment in Health Care*. Vol. 16, No. 4, 2000, pp. 1077-1091.
- <sup>26</sup> Farquhar CM, Kofa EW, Slutsky JR. Clinicians' Attitudes to Clinical Practice Guidelines: A Systemic Review. *MJA*. Vol. 177, November 4, 2002, pp.148-157.
- <sup>27</sup> IOM. Roundtable on Evidence-Based Medicine. Institute of Medicine, 2006

- 
- <sup>28</sup> The AGREE Collaboration. Development and Validation of an International Appraisal Instrument for Assessing the Quality of Clinical Practice Guidelines: The Agree Project, *Quality and Safety in Health Care*. Vol. 12, 2003, pp. 18-23.
- <sup>29</sup> Henderson AJ, Davies J, Willet MR. The Experience of Australian Project Leaders in Encouraging Practitioners to Adopt Research Evidence in Their Clinical Practice. *Australian Health Review*. Vol. 30, No. 4, November 2006, pp. 474-484.
- <sup>30</sup> Richman R, Lancaster DR. The Clinical Guideline Process within a Managed Care Organization. *International Journal of Technology Assessment in Health Care*. Vol. 16, No. 4, 2000, pp. 1061-1076.
- <sup>31</sup> Straus SE, Jones G. What Has Evidence-based Medicine Done for Us? (Editorial). *BMJ*. Vol. 329, 2004, pp. 987-988.
- <sup>32</sup> Woolf SH, Grol R, Hutchinson A, Eccles M, Grimshaw J. Potential Benefits, Limitations, and Harms of Clinical Guidelines. *BMJ*. Vol. 318, February 20, 1999, pp. 527-530.
- <sup>33</sup> Cockburn J. Adoption of Evidence into Practice: Can Change be Sustainable? *MJA*. Vol. 180, March 15, 2004, pp. 66-67.
- <sup>34</sup> Richman R, Lancaster DR. The Clinical Guideline Process within a Managed Care Organization. *International Journal of Technology Assessment in Health Care*. Vol. 16, No. 4, 2000, pp. 1061-1076.
- <sup>35</sup> Grol R, Wensing M, What Drives Change? Barriers to and Incentives for Achieving Evidence-based Practice. *MJA*. Vol. 180, March 15, 2004, pp. 57-60.
- <sup>36</sup> Cockburn J. Adoption of Evidence into Practice: Can Change be Sustainable? *MJA*. Vol. 180, March 15, 2004, pp. 66-67.
- <sup>37</sup> Sprague L. Quality in the Making: Perspectives on Programs and Progress, National Health Policy Forum, George Washington University, Washington DC, April 2001, pp. 2-14.
- <sup>38</sup> Ellrod AG, Conner L, Riedinger M, Weingarten S. Measuring and Improving Physician Adherence with Clinical Practice Guidelines: A Controlled Interventional Trial. *Annals of Internal Medicine*. Vol. 122, No. 4, February 15, 1995.
- <sup>39</sup> Michie S, Lester K. Words Matter: Increasing the Implementation of Clinical Guidelines. *Quality and Safety in Health Care*. Vol. 14, 2005, pp. 367-370.
- <sup>40</sup> Brand C, Landgren F, Hutchinson A, Jones C, MacGregor L, Campbell D. Clinical Practice Guidelines: Barriers to Durability after Effective Early Implementation. *Internal Medicine Journal*. Vol. 35, 2005, pp. 162-169.
- <sup>41</sup> Wolff M, Bower DJ, Marbella AM, Casanova JE. U.S. Family Physicians' Experiences with Practice Guidelines. *Clinical Research Methods*. Vol. 30, No. 2, 1998, pp. 117-121.
- <sup>42</sup> Sprague L. Quality in the Making: Perspectives on Programs and Progress, National Health Policy Forum, George Washington University, Washington DC, April 2001, pp. 2-14.
- <sup>43</sup> Borkowski NM, Allen WR. Does Attribution Theory Explain Physicians' Non-acceptance of Clinical Practice Guidelines? *Hospital Topics*. Vol. 81, No. 2, Spring 2003, pp. 9-21.
- <sup>44</sup> Garfield FB, Garfield JM, Clinical Judgment and Clinical Practice Guidelines. *International Journal of Technology Assessment in Health Care*. Vol. 16, No. 2, 2000, pp.1050-1060.
- <sup>45</sup> O'Brien JA, Jacobs LM, Pierce D. Clinical Practice Guidelines and the Cost of Care: A Growing Alliance. *International Journal of Technology Assessment in Health Care*. Vol. 16, No. 4, 2000, pp. 1077-1091.
- <sup>46</sup> Farquhar CM, Kofa EW, Slutsky JR. Clinicians' Attitudes to Clinical Practice Guidelines: A Systemic Review. *MJA*. Vol. 177, November 4, 2002, pp.148-157.
- <sup>47</sup> IOM. Roundtable on Evidence-Based Medicine. Institute of Medicine, 2006
- <sup>48</sup> IOM. Roundtable on Evidence-Based Medicine. Institute of Medicine, 2006
- <sup>49</sup> Stone TT, Schweikhart SB, Mantese A, Sonnad SS. Guideline Attribute and Implementation Preferences among Physicians in Multiple Health Systems. *Quality Management in Health Care*. Vol. 14, Issue 3, July-September 2005.
- <sup>50</sup> Rosenthal MB, Dudley RA. Pay-for-Performance: Will the Latest Payment Trend Improve Care? *The Journal of the American Medical Association*. Vol. 297, No. 7, February 21, 2007, pp. 740-744.
- <sup>51</sup> Performance Measurement Workgroup, Ambulatory Care Quality Alliance, AQA Parameters for Selecting Measures for Physician Performance, Vol. 3, April 2006.
- <sup>52</sup> Performance Measurement Workgroup, Ambulatory Care Quality Alliance, AQA Parameters for Selecting Measures for Physician Performance, Vol. 3, April 2006.
- <sup>53</sup> Keng B, Tan H. Clinical Practice Guideline: A Critical Review. *International Journal of Health Care Quality Assurance*. Vol. 19, No. 2, 2006, 195-220.
- <sup>54</sup> Michie S, Lester K. Words Matter: Increasing the Implementation of Clinical Guidelines. *Quality and Safety in Health Care*. Vol. 14, 2005, pp. 367-370.
- <sup>55</sup> Wolff M, Bower DJ, Marbella AM, Casanova JE. U.S. Family Physicians' Experiences with Practice Guidelines. *Clinical Research Methods*. Vol. 30, No. 2, 1998, pp. 117-121.
- <sup>56</sup> Larson E. Status of Practice Guidelines in the United States: CDC Guidelines as an Example. *Preventive Medicine*. Vol. 36, 2003, pp. 519-524.

- 
- <sup>57</sup> Stone TT, Schweikhart SB, Mantese A, Sonnad SS. Guideline Attribute and Implementation Preferences among Physicians in Multiple Health Systems. *Quality Management in Health Care*. Vol. 14, Issue 3, July-September 2005.
- <sup>58</sup> Grol R, Wensing M. What Drives Change? Barriers to and Incentives for Achieving Evidence-based Practice. *MJA*. Vol. 180, March 15, 2004, pp. 57-60.
- <sup>59</sup> Prochaska JO, DiClemente CC. Stages and Processes of Self-Change of Smoking: Toward an Integrative Model of Change. *Journal of Consulting and Clinical Psychology*. Vol. 51, No. 3, 1983, pp. 390-395.
- <sup>60</sup> Sanson-Fisher RW. Diffusion of Innovation Theory for Clinical Change. *MJA*. Vol. 180, March 15, 2004, pp. 55-56.
- <sup>61</sup> Puffer, S, Rashidian A. Practice Nurses' Intentions to Use Clinical Guidelines. *Journal of Advanced Nursing*. Vol. 47, No. 5, 2004, pp. 500-509.
- <sup>62</sup> Stone TT, Schweikhart SB, Mantese A, Sonnad SS. Guideline Attribute and Implementation Preferences among Physicians in Multiple Health Systems. *Quality Management in Health Care*. Vol. 14, Issue 3, July-September 2005.
- <sup>63</sup> Davis DA, Ciurea I, Flanagan TM, Perrier L. Solving the Information Overload Problem: A Letter from Canada. *MJA*. Vol. 180, March 15, 2004, pp. 48-49.
- <sup>64</sup> Henderson AJ, Davies J, Willet MR. The Experience of Australian Project Leaders in Encouraging Practitioners to Adopt Research Evidence in Their Clinical Practice. *Australian Health Review*. Vol. 30, No. 4, November 2006, pp. 474-484.
- <sup>65</sup> Mehta NB. The Doctors' Challenge: How Can We Follow Guidelines Better? *Cleveland Civic Journal of Medicine*. Vol. 71, No. 2, February 2004, pp. 81-85.
- <sup>66</sup> IOM. Roundtable on Evidence-Based Medicine. Institute of Medicine, 2006
- <sup>67</sup> Phillips LS, Branch WT, Cook CB, Doyle JP, El-Kebbi IM, Gallina DL, Miller CD, Ziemer DC, Barnes CS. Clinical Inertia. *Annals of Internal Medicine*. Vol. 135, 2001, pp. 825-834.
- <sup>68</sup> Del Mar CB, Mitchell GK. Feedback of Evidence into Practice. *MJA*. Vol. 180, March 15, 2004, pp. 63-65.
- <sup>69</sup> Sharon E. Straus and Giselle Jones. What has evidence based medicine done for us? *BMJ*. Vol. 329, October 30, 2004, pp. 987-988.





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