

**Essay**

## **The Prevalence and Special Educational Requirements of Dyscompetent Physicians**

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### **Abstract**

*Underperformance among physicians is not well studied or defined; yet, the identification and remediation of physicians who are not performing up to acceptable standards is central to quality care and patient safety. Methods for estimating the prevalence of dyscompetence include evaluating available data on medical errors, malpractice claims, disciplinary actions, quality control studies, medical record review studies, and in-stream assessments of physician performance. These data provide a range of estimates from 0.6% to 50%, depending on the method. A reasonable estimate of dyscompetence appears to be 6% to 12%. Age-related cognitive decline, impairment due to substance use disorders, and other psychiatric illness can contribute to underperformance, diminishing physicians' insight into their level of performance as well as their ability to benefit from an educational experience.*

*Currently, dyscompetent physicians in the United States are identified through either the legal system or peer review. The primary method of resolving issues of underperformance in physicians is through continuing medical education (CME). Although a number of specialized assessment and education programs exist in the United States, these programs are largely underutilized. Similar programs exist in Canada and have provided evidence of the efficacy of a more specialized and individualized educational approach for underperforming physicians. Current specialty programs focused on this population employ individual assessments of knowledge and performance, individually designed educational programs, long-term plans for maintenance of educational activity, and repeated assessment of performance level. Noting that few CME programs offer these requirements, a number of changes to current medical quality assurance programs that might foster such educational requirements for underperforming physicians are provided.*

**Key Words:** Physician dyscompetence, prevalence, underperformance, continuing medical education, undergraduate, remediation assessment, continuing professional development

### **Introduction**

This article was developed after a number of discussions with colleagues from different fields concerning the prevalence and social

costs of physician dyscompetence. During these discussions, it became apparent that the commonly held belief is that whereas dyscompetence is present, the vast majority of poor patient outcomes is attributable to system failures. As will be discussed, dyscompetence is a substantial problem in terms of prevalence and by inference a major cost in quality of health and economics of society. In this article, I apply theory and data from several fields to assess the probable prevalence, possible etiologies, and remedial approaches to physician dyscompetence. I conclude with recommendations to assist in the identification and treatment of

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dyscompetent physicians and potential areas of research.

Although the *American Heritage Dictionary of the English Language* states, "Competence means the state or quality of being adequately or well qualified; a specific range of skill, knowledge, or ability," competence is a term of art in a number of fields. Three that are more directly related to this discussion are medicolegal, medical educational, and psychological. The term *competence* is used slightly differently in each. The medical education and psychology literatures use competence in conjunction with the term *performance*. In medical education, competence denotes knowledge, skills, and ability as assessed by tests; in contrast, performance is demonstrated in clinical practice.<sup>1</sup>

In the field of psychology, the dichotomy between competence and performance is similar; however, competence is an unobservable quality or ability whereas performance is the observable behavior in specific situations determined by 1 specific competency or by a set of competencies. So competence is the inherent internal maximum ability of an individual whereas performance is a person's performance on a test.

The Federation of State Medical Boards' Special Committee on Evaluation of Quality of Care and Maintenance of Competence<sup>2</sup> defines *competence* as possessing the requisite abilities and qualities to perform effectively in the scope of professional practice. Following completion of formal medical training, the US Medical Licensing Examination is used to determine whether an individual possesses the skills and abilities necessary to practice independently. Physicians who wish to practice in the United States but are trained elsewhere must be certified by the Educational Commission for Foreign Medical Graduates to obtain an unrestricted license to practice in the United States. Although clear guidelines and criteria exist to determine qualifications for initial licensure, criteria regarding what constitutes ongoing competency to practice and methods of evaluation are less clear.

In 2003, the Federation of State Medical Boards defined *dyscompetence* as a failure to maintain acceptable standards in 1 or more areas of professional practice.<sup>2</sup> Several potential factors contribute to physician dyscompetence, including poor initial preparation during medical school or residency, a failure to maintain currency over the course of one's practice, and impairment—the inability of a physician to practice medicine with reasonable skill and safety by virtue of a mental or physical illness or excessive use or abuse of a controlled substance, alcohol, or other substances that impair ability.<sup>3</sup> Currently there is no consensus on an operational definition of medical dyscompetence.

Standardized testing for licensure or board certification, such as that developed by the National Board of Medical Examiners or the member boards of the American Board of Medical Specialties, typically set an acceptable deviation from the population mean performance such as 2 SD below the mean. Legal standards typically are based on a definition of a community's standard of practice. The lack of a consensus on an operational definition complicates attempts to determine the prevalence of physician dyscompetence or underperformance.

Where *dyscompetent* is defined as a failure to maintain acceptable standards, in this article the term *underperformance* refers to a level of performance that is below expectation. This is consistent with the psychological literature, which suggests that normal performance is within 1 SD of the mean. Underperformance is intended as a broader category than dyscompetence to indicate a physician's decline in performance or whose performance is significantly lower than that of his or her peers. Such a term would include physician dyscompetence but also refer to the need for remedial training (Figure 1). As with dyscompetence, in this article, I use the term underperformance in the medicolegal sense. Differences in the use of terms challenge

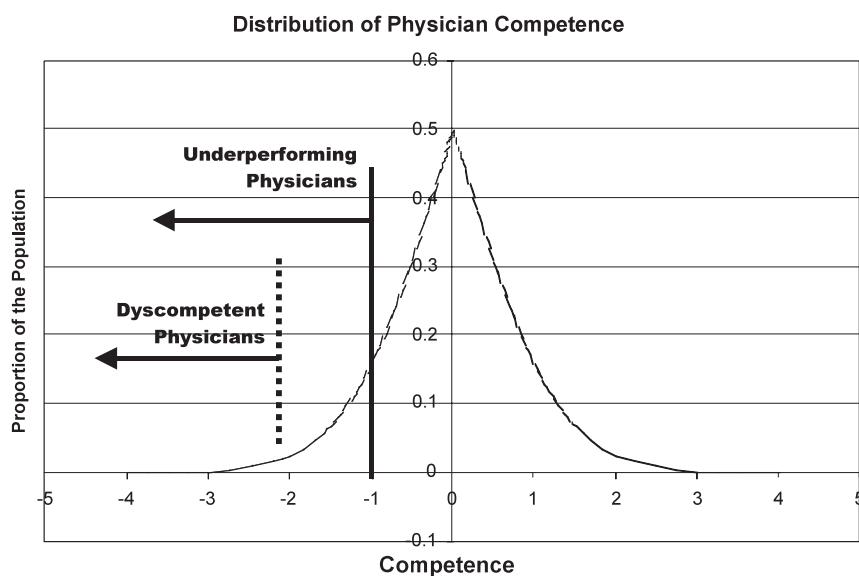


Figure 1. The sampling distribution of physicians ordered by competence showing proportion of underperforming physicians and among them dyscompetent physicians.

diverse policymakers and practitioners to compare research findings and then determine the implications of research for educational, quality assurance, or licensure programs.

### Approach

I review selected sources for estimating the prevalence of physician dyscompetence. I consider evidence from the quality improvement, medicolegal, and medical education literatures. Estimates are offered based on medical errors, legal action, regulatory action, national standards, medical records review, recertification rates, and assessment data. Although it is clear that primary medical education, organization-related factors, and system-level influences are important to successful performance, other factors also are important.<sup>4</sup> Failures and adverse outcomes result also from poor individual performance, a much less studied phenomenon. Characteristics of an individual physician and how they might contribute to dyscompetence

make up the focus of this article. Various educational attempts are discussed, with a summary, conclusions, and suggestions for further research. Because this is not a comprehensive review of the literature on medical education, quality improvement, or patient safety, articles that others may find key might not be cited. I include a reasonably broad, although not exhaustive, review of the literature on medical dyscompetence using the key words *prevalence*, *dyscompetence*, and *physician dyscompetence* and attendant literature on medicolegal competence and performance, with emphasis on individual factors.

### Prevalence of Physician Dyscompetence, Underperformance, or Both

The prevalence of medical error suggests a measure of physician underperformance and dyscompetence. Several sources document physician-based errors in the United States. Among the most visible is the Institute of Medicine (IOM), which estimates that medical

errors are the eighth leading cause of death in the United States, leaving 44,000 to 98,000 people dead each year due to medical errors.<sup>5</sup> In addition, the IOM suggests that medical errors cost the country \$37.6 billion, \$17 billion of it associated with preventable errors.<sup>5</sup>

A second estimate of medical error in the United States is based on legal actions against physicians. The National Practitioner Data Bank was created through the Health Care Quality Improvement Act of 1986 with the purpose of acting as a “flagging” system that could identify potentially problematic practitioners. From 1990 to 2001, the total number of reports made to the data bank, including malpractice payments and adverse licensure or disciplinary actions, was 291,520, or an average of 1.63 per practitioner. Data on individual practitioners are available only to licensing bodies and credentialing authorities.<sup>6</sup> Based on claims paid, some 7% of US physicians have claims of medical malpractice in the United States each year.<sup>7</sup>

The number of physicians disciplined by state medical regulatory authorities is also suggestive of the prevalence of dyscompetent physicians. Some 0.3% to 0.5% of physicians are disciplined annually for serious infractions of their states’ medical licensure acts.<sup>8,9</sup>

Another strategy for identifying the number of physicians who are dyscompetent is to use industrial quality control procedures. For example, identifying those who are performing at or below 6 SD of the mean has the potential of identifying systemic quality issues, suggesting that only 3 physicians in the United States have quality issues. This also implies that medicine in this country meets 6 sigma ( $\sigma$ ) criteria or that the probability of a medical error in any procedure is 1 in a million or less. In a review of medical quality, the figures for medical errors were found to range from 1 in 1,000 to 1 in 10,000, far below the 6- $\sigma$  level.<sup>10</sup>

Several studies focus on adherence to particular medical standards of care. Because adherence to standards is not a requisite for acceptable performance, adherence to standards might be

taken as an estimate of underperformance rather than dyscompetence. Surveys of physicians meeting national standards of care for a particular disease suggest a far lower than 6- $\sigma$  performance. In studies looking at continuing care of patients with identified risk for cardiovascular accident, high blood pressure, and autoimmune deficiency syndrome, physician adherence to published standards of medical treatment ranged from 1 in 20 to 1 in 2 physicians.<sup>11–13</sup>

Another approach to assessing physician underperformance is through the review of patient medical records. Asch and colleagues<sup>14</sup> at the Rand Corporation found that 1 physician in 4 met the criteria of care based on a review of 1,000 patient medical records. Chellis and associates<sup>15</sup> conducted a retrospective clinical review of emergency department medical records to evaluate errors in diagnostic processes. Only 0.6% of the reviewed records contained 1 or more errors in the diagnostic process that contributed to a misdiagnosis.

Another possible way to estimate the prevalence of dyscompetence is to look at failure rates for specialty board recertification rates. Leape and Fromson<sup>9</sup> looked at these data for 4 specialty areas and 1 subspecialty area in 2004 and report failure rates of 1% to 14%.

There have also been attempts to identify physician underperformance in other countries. A number of provinces in Canada have undertaken prospective in-stream screening of physicians. McAuley and colleagues reported that 15% of general and family practice physicians were identified as having serious deficiencies in record keeping or level of patient care.<sup>16</sup> However, the proportion of certificants with serious deficiency was lower: 2% to 3%. Predictors of poor performance were age, certificant membership status, and type of practice.

The Alberta program used a 360-degree survey method as a prescreening instrument followed by an on-site assessment for those performing in the lower third. Approximately 9% of the physicians in the pilot study gave evi-

dence of a survey performance that was more than 1 SD from the peer group means in 3 or more of the 5 domains assessed. Based on this procedure, 1 of 100 physicians was found to be in need of remedial training.<sup>17,18</sup>

Based on comparative longitudinal data on 109 nonspecialist physicians, Norton and Faulkner<sup>19</sup> reported that about 10% of nonspecialist physicians needed significant assistance with their practice, with 18% of those physicians being 70 years or older.

Using multimethod assessment of clinical performance of a representative nonvolunteer sample of family physicians in the metropolitan Montreal area, Goulet and associates<sup>20</sup> found that 6% of those assessed had less than good performance in quality of care, with 25% having less than good record keeping. In another study, Goulet and colleagues<sup>21</sup> evaluated 305 physicians over the period 1992 through 2002 and reported the prevalence of physicians with deficiencies to be 1.9%.

### Limitations

Each of the methods reviewed has limitations. The use of medical errors as an indicator of physician dyscompetence suffers from the concatenation of individual physician errors with all other sources of error in the delivery of medicine, so it might be taken as an overestimate of error by individual physicians. The use of litigation-based estimates suffers from the fact that many states use a contributory negligence standard: the physician might contribute in some way to the error but not be the primary cause of the error and still be found liable. Second, some portion of cases might, in fact, be baseless, but a decision is made because it is not economic to contest the case.<sup>7</sup> A number of studies indicate that the quality of communication between a physician and patients is predictive of the probability of litigation.<sup>22,23</sup> Also, malpractice can result from the failure not only to diagnose or treat a condition but also to obtain informed consent, from equipment malfunction, and from system errors or as a

result of professional misconduct. Outcome studies of closed malpractice cases suggest that there is about a 50% correlation between actual medical error and malpractice claims.<sup>24</sup> It is also true that less than 50% of actual medical errors result in a malpractice claim.<sup>25</sup>

Another limitation to the use of litigation frequency as an indicator of the prevalence of dyscompetent physicians is that legal actions and claims are not randomly and evenly distributed across the physician population. Physicians who have prior cases of malpractice are more likely to have subsequent malpractice filings. Most malpractice claims can be attributed to a small percentage of the physician population.<sup>26,27</sup> Although these studies employ descriptive data on the characteristics of the physicians sued, standardized data on their knowledge base are unavailable.

The use of disciplinary action as an estimate of the prevalence of dyscompetence has many of the same problems as the use of litigation. Several recent studies describe the risk of disciplinary actions by state medical regulatory authorities.<sup>28-31</sup> For disciplinary actions to provide an unbiased estimate of the prevalence of dyscompetent physicians, overall disciplinary risk must be equal to the sum of the unique contributions to dyscompetence of the explanatory variables. Findings have been contradictory. Most studies suggest that the length of time after graduation (greater time) and gender (male) predict an increased risk of medical authority action.<sup>28-31</sup> Mixed results were reported for the country of training. Most found that graduates of foreign medical schools were at higher risk, but Cardarelli and associates<sup>29</sup> found the opposite. Some found that obtaining specialty board certification reduces the risk of medical authority action<sup>30,31</sup>; others did not.<sup>32</sup> With the exception of specialty board certification, these variables again provide little insight as to primary causes. A study by Papadakis and colleagues<sup>33</sup> report that physicians with a history of behavioral problems in medical school, in particular, problems related to issues of professionalism, are more

likely to be disciplined by medical authorities. However, in a recent report, Goulet and coworkers<sup>34</sup> found no statistical differences between those with difficulties or failed residencies and other physicians with performance problems.

Many factors contribute to physician adherence to standards of care, including whether adherence is voluntary or is monitored, the source of the guidelines, and whether the recommendations are based on evidence from clinical trials.<sup>9</sup> Thus, it is unclear how accurate or reflective an adherence to standards is as a measure of physician dyscompetence. The extent to which medical record reviews accurately capture physician dyscompetence also is unclear. In an assessment of medical record audits versus interactive medical vignettes, medical record review was found to overestimate physician underperformance.<sup>35–37</sup>

Failure rates for specialty board recertification would appear to be a reasonable estimate of physician dyscompetence. However, several factors might cause the test to inaccurately reflect a person's underlying knowledge. Situational factors such as anxiety or depression and external stressors such as divorce, family illness, or fatigue may contribute to poor results.

Given the differences in methods and problems inherent in each, it is not surprising that prevalence estimates of physician dyscompetence demonstrate a large range (see Table 1 for a review): from a low of 0.3% based on the number of physicians disciplined in a year to nearly 50% based on the number of physicians who do not adhere to treatment guidelines. Because of the widely disparate nature of the sources of the prevalence, a meta-analysis is of limited value. The primary operational definition for dyscompetence is medicolegal, and thus a prevalence estimate must start there. Most of the other estimates are actually higher than the estimate derived from the disciplinary rate. The studies coming closest to population surveys are the Canadian provincial reviews. In these, the range is more restricted: about 2% of all physicians to about 15% of noncertificiant practitioners. If one

chooses the center of these ranges as a reasonable first approximation, the number of physicians whose performance includes significant deficits would be between 6% and 12% (see Table 2 for a summary).

### **Causes of Physician Dyscompetence and Underperformance**

Factors such as inadequate access to continuing education, poor initial training, solo practice, and organizational and systems factors all can contribute to errors in medical delivery and clearly interact with individual differences in ways that may exacerbate or minimize deficiencies. I do not attribute all poor outcomes, medical errors, malpractice claims, or even the identification of a physician as dyscompetent exclusively to individual internal factors. However, the focus of this article is on individual characteristics that contribute to dyscompetence.

#### **Effects of Aging**

There is a lengthy literature evaluating changes in cognition that develop as a function of age. Aspects of memory such as free recall, encoding and retrieval, visuospatial abilities, abstraction, and mental flexibility decline with age.<sup>38</sup> Findings of a negative correlation between age and medical performance have been reported by Norman and coworkers,<sup>39</sup> McAuley and associates,<sup>16</sup> and Sample and colleagues.<sup>40</sup> Norton and associates<sup>41</sup> had findings that suggest that as physicians age, they are more likely to be identified through their peer review process as needing help; however, in many cases, the physicians were not aware of their deficiencies before the assessment. Turnbull and coworkers<sup>42</sup> studied the neuropsychological performance of physicians referred for remedial training on neuropsychological tests. They found a strong negative correlation between performance and age. This correlation actually increased when the sample was altered by the exclusion of physicians with diagnosable neuropsychological disorders.

Choudhry and colleagues<sup>43(p260)</sup> reviewed the available published data between 1966 and June 2004 and concluded: "Physicians who have been in practice longer may be at risk for providing lower quality care." Similar findings suggesting a negative correlation between age and disciplinary actions have also been reported.<sup>29-32</sup>

As part of a project designed to develop a computerized test to screen for age-inappropriate mental decline in physicians, Weintraub and colleagues<sup>44</sup> assessed cognitive functioning in physicians ranging in age from 28 to 92 years. Those physicians aged 75 and older who gave evidence of cognitive performance that overlapped with the average performance of a group of physicians younger than 35 performed distinctly worse on the analogies subtest (a test of reasoning). In an evaluation of the 2 oldest age groups, the subtests that distinguished the top performers from those at the bottom were tests of attention, memory, and reasoning.

There is also evidence that suggests a difference in how older and younger physicians perform on standardized tests of medical knowledge. Norcini and associates<sup>45</sup> found a significant negative correlation between age and performance on a board-recertification examination. However, they concluded that this correlation is the result of older physicians not acquiring new knowledge, based on their finding that older physicians performed as well as younger physicians on tests of knowledge where the information had not changed since medical school training.<sup>46</sup>

Fluid intelligence, which is a more effortful process and is defined as active reasoning or analysis, has been shown to decrease with age whereas crystallized intelligence, which is based on learning and experience, remains relatively stable over time.<sup>47</sup> Knox<sup>48</sup> emphasizes that the combination of fluid-crystallized intelligence is stable over the lifespan. Basing conclusions on his review of the literature on the relationship between age and performance, Eva<sup>49,50</sup> suggests that age has a significant effect on the performance of health professionals. He argues that

changes in fluid intelligence might explain the pervasive finding of older physicians' decline in performance on diagnostic reasoning tests as well as tests of medical judgment. Eva argued that although much of medical education is based in memory and memorized procedure, actual clinical practice requires mental flexibility. Such flexibility is based in executive functioning, which appears to be largely mediated by frontocortical neural structures. These structures can be impaired by a number of age- and substance-related pathologies.

### Neuropsychological Dysfunction

Williams and colleagues<sup>51</sup> examined the performance of physicians referred to an assessment and remedial education program on 2 tests associated with executive functioning. Physicians referred to this program performed at levels significantly lower than the population as a whole. These findings are consistent with the hypothesis advanced by Eva<sup>49</sup> that executive functioning, in particular mental flexibility, is key to performance in clinical settings. Perry and Crean<sup>52</sup> looked at the neuropsychological performances of disciplined physicians referred for specialized competency assessment and medical education. Relative deficits in performance were noted on tests of sequential processing, attention, logical analysis, eye-hand coordination, and verbal and nonverbal learning.

Korinek<sup>53</sup> compared the performance of a group of physicians referred for clinical competency assessment with a group of comparison physicians on a computerized neuropsychological battery. Approximately half the referred group was primary care physicians. None of the physicians in the comparison group performed below normal expectation whereas 24% of the competency-referred group performed below expectation. The data from the few available studies of neuropsychological performance of physicians referred for competency concerns and those of Hanna and Turnbull and colleagues<sup>42,54</sup> suggest that physicians with competency concerns are at

**Table 1 Studies Related to the Prevalence of Physician Competence**

<b>Approach</b>	<b>Study</b>	<b>Description</b>	<b>Results</b>	<b>Limitations</b>	<b>Conclusions</b>
Quality improvement	Kohn et al., 1999 <sup>5</sup>	Review of secondary data	44,000 to 98,000 mortalities per year due to medical error	Focus on overall outcomes, not physician error	Concluded that periodic review of medical competence is needed
	Chassin, 1998 <sup>10</sup>	Review of hospital data	Error rates in the range of 1/100 to 1/1,000	Focus on overall outcomes, not physician error	Concluded that a greater focus on TQC or CQI was necessary
Legal	Larcher et al., 2005 <sup>7</sup>	Review of claims		Malpractice judgments are not perfectly correlated with errors	Judgments can be paid on baseless claims
Regulatory	Public Citizen, 2006 <sup>8</sup>	Review of regulatory reports	0.3% of physicians annually are found guilty of serious infractions	Variations in regulatory review	Physician infractions are underreviewed
Standards of care	Hobbs and Erhardt, 2002 <sup>11</sup>	Telephone inter views in 5 European countries about CHD prevention	89% agreed with the importance of the guidelines; 18% believed the guidelines were being implemented	Data are self-report or opinions concerning others	More support is needed for the implementation of CHD and cholesterol management
	Metsch et al., 2004 <sup>13</sup>	Mail survey to physicians concerning counseling to HIV-infected patients	60% reported counseling 90% of new patients; 16% reported counseling 76% of new patients	Data are self-report	Interventions are needed to help physicians overcome barriers to counseling
	Asch et al., 2004 <sup>14</sup>	Analysis of quality indicators from an electronic patient database	51% of the national sample adhered to the indicators	Differences in reporting approaches are not quantified	Established reporting measures and quality standards yield better delivered care

Chellis et al., 2001 <sup>15</sup>	Comparison of emergency department diagnosis with discharge diagnosis	0.6% of records indicated initial misdiagnosis	Limited to a single university-based hospital system	Rate of physician error is low
Remediation programs	Office inspections by peers of a stratified random sample of physicians	18% had deficient records, deficient care, or both; 52% of reassessed deficit physicians made the recommended changes to their practice	Based on medical record review	Demonstrates the need and feasibility of a peer review program
Hall et al., 1999 <sup>18</sup>	360-degree rating of performance of a random sample of physicians	9.1% were 1 SD or more from the population performance in 3 or more of 5 assessment domains	Based on qualitative ratings	Pilot study effective enough that a rovince-wide implementation was made
Norton and Faulkner, 1999 <sup>19</sup>	Office inspections by peers of a stratified random sample of physicians	64.2% of physicians assessed across a 10-year period declined in rating	Based on a small sample of physicians available for a repeated assessment	Consistent finding that performance declines with age
Norton et al., 2004 <sup>41</sup>	Office inspections by peers of a stratified random sample of physicians	13.2% of those assessed required mandatory reassessment or were found to cause major concerns about their practice	Based on medical record review	Confirms the effectiveness of the peer review program
Goulet et al., 2002 <sup>20</sup>	Record review, qualitative ratings	94% rated excellent on quality of care; 75% rated excellent on record keeping	Based on qualitative ratings	Reports overall performance as "excellent"

TQC = ??, CQI = ??, CHD = congestive heart disease.

**Table 2 Summary of Estimates of Physician Underperformance, Dyscompetence, and Error Rates**

<b>Class</b>	<b>Data Source for Estimation</b>	<b>Range of Estimate, %</b>	<b>Strengths</b>	<b>Weaknesses</b>
Underperformance	Medical record review	0.6 to 50	Population-based estimate of medical record	Possibly over-estimates error rate
	In-process reviews	2 -to 15	Population-based estimate of medical record	No similar data in US
	Recertification rates	1 to 14	Based on ABMS recertification data	Not all physicians are board certified, and some who are have “grandfathered” status
Dyscompetence	Disciplinary action	0.3	Direct assessment of physician actions	Complaint driven, includes nonprocedural infractions
	Litigation	7	Direct assessment of physician actions	Litigation driven, imperfect relationship between claims paid and errors
Error rates	Institute of Medicine	0.1 to 0.2/ hospitalization	Relates directly to outcomes	Strictly hospital based
	Record review	0.01 to 0.1/ procedure	Based on hospital records	Strictly hospital based

ABMS = American Board of Medical Specialties

higher risk for undiagnosed cognitive problems and that these difficulties could affect the physicians’ ability to benefit from even a highly individualized, intensive continuing medical education (CME) experience.

Age-correlated dementias have been shown to affect not only memory but also executive functioning, the same capacities required of complex medical reasoning. In 2000, 4.5 million persons suffered from Alzheimer’s disease in the United States; it is projected that 5.1 million people will have the disease by 2010.<sup>55</sup> Although there are no

studies that quantify cognitive decline in physicians,<sup>9</sup> one might hypothesize that physicians’ incident rates of dementia are consistent with the rest of the population. With the physician population aging, a greater proportion of physicians will suffer from these dementias. There is currently no mechanism other than peer review and wellness committees to cause physicians with possible dementia processes to undergo assessment for mental or clinical competence.

In a remedial education program in Ontario, a small percentage of underperforming physi-

cians did not respond to efforts on the part of the province.<sup>54</sup> The authors speculated that this might have been due to physical or psychological problems in the physicians. Such a possibility is consistent with other findings of possible neuropsychological deficits in physicians referred to assessment and remediation by medical regulatory authorities.<sup>42,51</sup>

### External Stressors

In addition to age-related decline and neurological conditions, physical illness, external stressors such as fatigue, anxiety, family strife, burnout, and other psychiatric disorders including personality disorders can also contribute to reduced performance.<sup>56</sup> Although there are no studies on the incidence of physical illness in the physician population, Leape and Fromson<sup>9</sup> estimate that at least 10% of physicians restrict their practice for several months or more because of physical illness such as heart disease, diabetes, or surgical procedures. It is unclear what effect their illness or the time away from practice has on their ability.

Extrapolating from the data on neuropsychological performance, such diseases as mood disorders (depression, dysthymia, bipolar disease), severe personality disorder, and adjustment disorder, particularly when accompanied by depressed mood, anxiety, or both, may also affect the ability to provide competent medical judgments. Data suggest that those in the medical profession suffer disproportionately from severe mood disorders and at least proportionately from other forms of mental disease.<sup>57</sup>

### Substance Use

Neuropsychological studies suggest that chronic alcohol use affects cognitive functioning, with deficits noted in a variety of areas including executive functions, visuospatial abilities, and gait and balance and that the central nervous system sequelae may be long lasting and even permanent in some cases.<sup>58-60</sup> Recovery of function

following chronic alcohol use is inversely related to age and duration of abstinence.<sup>61</sup> Dysfunction on frontal lobe tasks has been noted in apparently healthy abstinent alcoholics who demonstrated above-average intellectual functioning.<sup>62</sup>

Physicians appear to be approximately proportionate with the general population in their incidence of substance-related disease based on studies of medical students, residents, and physicians.<sup>63-66</sup> According to Fromson and Leape,<sup>9</sup> the Medical Board of California estimates that 18% of physicians in their state abuse alcohol or other drugs at some point in their career. It is plausible to hypothesize that those engaged in practice who also use substances or are substance dependent spend less time on activities that would encourage new learning. This is likely compounded by difficulties acquiring new information while using substances.

In terms of recovery, physicians are reported to have a higher sobriety rate after treatment than the general population.<sup>63</sup> This is likely, at least in part, due to strict after-care and monitoring programs that often require regular attendance at supportive meetings, individual therapy, and random drug and alcohol screens for a minimum of 2 to 5 years. These requirements are implemented through physician health programs that both advocate and monitor physicians. Most states, however, have no requirement for assessment of competence on returning to practice after achieving sobriety.

### Education of Dyscompetent Physicians

Dyscompetent physicians in the United States are identified predominantly through peer review or through regulatory disciplinary procedures. Once identified, if remediation is attempted, the practitioner may be directed toward traditional CME offerings or a specialized program that includes assessment as a first step.

Peer review is the most common and universal process for identifying physician performance issues in hospitals and other licensed care

facilities. Peer review became more widespread in the 1980s as the public and organized medicine increased its efforts to identify underperforming physicians through the promotion of credentialing and professional peer review. The core strength of peer review is that it is an assessment made by individuals who have direct knowledge of the person being reviewed, work in the same environment, and adhere to the same quality of care standards. As a result, it has considerable face validity as a method of identifying underperforming physicians.

Peer review also has some well-identified weaknesses. One commonly identified problem is that the assessment itself is frequently no more rigorous than testimonial letters. In a recent review of peer assessment instruments, only 3 published instruments were found to have an appropriate scientific basis,<sup>67</sup> and it can be difficult for physicians to approach and discuss or report quality concerns about peers. Furthermore, many versions of peer review historically have been limited to physicians who have privileges at inpatient facilities. Among family physicians in the United States, the percentage with admitting privileges was 85% in 1998, a reduction of 5% from 1988.<sup>68</sup> Such a process, for those physicians found wanting, can take a number of forms including mentoring, specific CME activities, proctoring, limiting privileges or procedures, or removal of privileges. In the last case, the facility may be required to report the revocation of staff privileges to the National Practitioner Data Bank. Each year, about 0.8% of all US physicians are reported to the database for this reason.<sup>6</sup>

Even though the percentage is small, the other major path for identification of dyscompetent physicians is through administrative and regulatory proceedings of state medical boards. A strength of the system is that it affords physicians under review all the protections of the state's legal system. A limitation is that although it provides a certain rigor of analysis, the decision is a legal rather than medical one, and the approach is complaint driven and not quality control driven.

State medical boards refer dyscompetent physicians they view as remediable to CME or specialized assessment and education programs. Even where other issues may be affecting a physician's delivery of care, the state boards often lack the authority and the staff to review medical systems or systems issues. Reviews<sup>69-72</sup> of traditional CME programs generally conclude that the efficacy of the activity is dependent on the involvement of the physician in identifying his or her learning needs, the level of interaction among physicians as learners, and opportunities to practice learned skills in sequenced and multifaceted activities.<sup>72</sup>

Although CME experiences are designed for the average physician, for a number of reasons, the typical CME experience likely will not meet the needs of a dyscompetent physician. First, many dyscompetent physicians are found to have specific areas of deficits. Second, a dyscompetent physician's initial education and training may have been inadequate, resulting in a lack of fundamental medical knowledge. Third, the physician may have had adequate initial training but has not kept up to date, and this is reflected in a more global pattern of deficit. Fourth, many dyscompetent physicians have special needs that provide a partial basis for their dyscompetence. Personal characteristics, abilities, traits, goals, motivations, and situational factors clearly contribute to an individual's ability to participate in and benefit from an educational endeavor.<sup>48</sup>

As has been documented in the educational literature, didactic instruction places great demands on the attentional abilities of learners. Many CME opportunities are lecture-style didactic classes. It is possible that such an experience would not meet the needs of older physicians or others with special needs. Individuals with deficits in executive function have particular difficulty with tasks that require sustained attention and often have reduced mental flexibility. Reduced mental flexibility can make changes in behavior, thoughts, and beliefs difficult. Many traditional CME activities are not accompanied

by an assessment beyond determining whether there has been an increase in knowledge. The available data on CME experiences are that even where new information is obtained, it is often difficult to demonstrate any change in decision making or practice patterns. It is important to note that these studies do not assess effect size, and there is evidence that even more modest interventions may have a small but meaningful effect on practice.<sup>73</sup>

In a recent review of specialized assessment and remediation opportunities in the United States,<sup>74</sup> PreP 4 Patient Safety, a research group of the Citizen Advocacy Center, surveyed 46 state agencies with responsibility for licensing physicians. Thirty-five assessment and remediation programs were reported to offer resources for dyscompetent physicians.<sup>74</sup> The findings suggest that although some states commonly use assessment programs to identify the needs of specific physicians before remediation efforts, they were in the minority. The training available through these assessment and remediation programs is somewhat more extensively employed than assessment services. The authors concluded that these resources—remedial training and, to a larger extent, assessment—remain underutilized tools for improving the performance of underperforming physicians.<sup>74</sup>

Much of the evidence on the efficacy of specialized educational programs for underperforming physicians comes from the Canadian experience. Goulet and colleagues<sup>21</sup> evaluated physicians before and after participation in a range of educational programs; 70% of the retraining activities led to attainment of training objectives. Older physicians and physicians with psychiatric, physical, addiction, or learning problems were excluded from the program, so this may be an overestimate of training efficacy. The data from Ontario's Physician Review and Enhancement Program demonstrated the efficacy of comprehensive assessment and targeted educational remediation. Most physicians identified

as needing improvement were able to improve and maintain their improved performances.<sup>41</sup>

## Unresolved Issues

Several issues remain unresolved in identifying and educating dyscompetent physicians. These would best be advanced through appropriately structured research. The terms *competence* and *performance* have distinct and important differences in medical education and psychology. Both disciplines are actively engaged in research in the general field of competence. In the United States, a competency assessment often focuses on psychological and psychiatric functioning. There is overlap between psychological and professional competence, and a rigorous review of the terminology and the theoretical constructs that underlie them would be an important contribution in this area.

At present, it is impossible to come up with a single best estimate of the extent of physician dycompetence. One of the main reasons for this is that there is no definition of dyscompetence that allows for a straightforward measurement. Whereas there is a medicolegal definition that is adequate for discipline by administrative law organizations, there is no generally accepted operational definition among the research community. Of obvious importance is the need for a rigorous operational definition of dyscompetence. Although medicolegal definitions may be appropriate to their context, ultimately they rely on validation from scholastic research. Another priority includes a population-based assessment to discover the prevalence of dyscompetence.

Following operationalization of the terms *competence*, *performance*, *dyscompetence*, and *underperformance* and once the prevalence of dyscompetence and underperformance in the population has been established, it would be important to determine the nature and effect of various risk factors. Specialized population studies designed to elucidate the nature of various risk factors would be valuable. For this work, it

would be important to establish a longitudinal design with specialized subsamples focused on particular risk factors. Longitudinal designs also would provide the opportunity to conduct outcome studies so that the efficacy of remedial interventions could also be examined.

Impediments to implementing comprehensive assessment and individualized remedial education programs include difficulty recruiting faculty because of concerns about liability and time; financial concerns for both the identified physician and the faculty (for example, does it affect faculty's clinical productivity?); and difficulty providing structured, supervised clinical opportunities. These issues would need to be addressed along with faculty development to foster the development, growth, and accessibility of these types of programs.

### **Summary and Conclusion**

In this article, I reviewed a number of methods of estimating physicians' dyscompetence, including medical error, malpractice litigation, regulatory disciplinary actions, medical records review, quality control procedures, recertification-failure rates, and in-stream review of physician performance. Each of these approaches has inherent difficulties. Based on this analysis, somewhere between 6% and 12% of practicing physicians may meet criteria for dyscompetence.

As discussed here, factors contributing to physician dyscompetence include affects of aging, psychiatric conditions (substance dependence, depression, dementia, personality disorder), or other health conditions. These same factors can have an adverse effect on cognitive functioning and contribute to diminished insight about one's level of performance and the decreased ability to learn, retain, and implement new knowledge. Physicians require constant new learning to keep abreast of the rapidly and continuously evolving field of medicine and a high level of functioning of executive processes in the normal execution of their responsibilities.

In addition to the difficulty of identifying dyscompetent physicians, there is no standard approach to their remediation. Data from CME research and from the Canadian remedial education studies strongly suggest the importance of comprehensive assessment as an initial step in remediation. Optimally, a proactive process involving different levels of screening would assist in early identification of physicians in need, with those physicians participating in a more in-depth assessment.

Other countries have initiated more proactive approaches. Finucane and colleagues<sup>75</sup> compared the performance assessment program for medical practitioners in Canada, Australia, New Zealand, and the United Kingdom. Citing an earlier article by Kaigas,<sup>76</sup> they distinguish among 3 levels of performance assessment. Level 1 assessment is a screening evaluation whereby entire populations or random samplings of physicians are assessed. According to an epidemiological model, this type of screening would be of relatively low cost and have high sensitivity: falsely identifying a physician who later is assessed as competent would be preferable to missing the identification of a dyscompetent physician. Level 2 assessments would target groups of high-risk practitioners. Based on current literature, an example of a high-risk group is older male physicians in solo practice. Level 3 would assess physicians in whom concerns had already been identified. This might include those with medical board actions against them, multiple lawsuits, or multiple patient complaints.

A tiered approach would enable prospective identification of those in need. Those performing poorly at level 1 or level 2 would receive additional assessment. Comprehensive assessment is necessary to understand the educational and potential health needs of dyscompetent physicians. A thorough understanding of the reasons for poor performance, whether in a standardized test situation or in clinical performance, is necessary so that appropriate interventions can be implemented. Assessment should include evalua-

tion of current health status as well as neuropsychological and psychological functioning to identify potential factors that require immediate medical intervention and that could affect a physician's ability to benefit from an educational experience. Assessment should also include different aspects of medical knowledge as well as clinical judgment, problem solving, clinical decision making, procedural skills, and communication skills. In addition to assessing physicians in an assessment center (competency-based assessment), it is important to assess their performance in clinical practice (performance-based assessment).<sup>1</sup> These data and the identification of volition and insight<sup>77</sup> are important in determining the nature of intervention, the likelihood a physician will benefit from the intervention, and the nature of required follow-up. When done in the context of a comprehensive assessment, systemic factors that may have contributed to the difficulty and that may support or stand in the way of improvement also can be identified and addressed.<sup>4</sup>

An approach to assessment and remediation based on these elements would be appropriate for physicians previously identified as dyscompetent as well as those returning to practice after a period of absence resulting from substance use or other psychiatric or medical illness. For older physicians, comprehensive assessments to identify physical health issues such as decreased vision or hearing, strengths and weaknesses, and learner characteristics will assist in targeting and individualizing the educational experience. Regularly scheduled follow-up is necessary to ensure that the information learned is being retained and implemented into practice. Such sessions present opportunities for continued observation, assessment, training, consolidation of knowledge, and reinforcement of appropriate new behaviors and practices. Minimal requirements for success include physical and neuropsychological assessment, individual assessments of both knowledge and performance, individually designed educational programs that provide the opportunity to implement the acquired knowledge in a clinical

### Lessons for Practice

- Although an operational definition of physician dyscompetence does not exist, a reasonable general estimate for its prevalence is 6% to 12%.
- Aging, mental or physical illness or both, and substance use can influence physician dyscompetence.
- Specialized comprehensive assessment and individualized remedial training are required to address the unique needs of dyscompetent physicians.
- Abilities, traits, goals, and motivations contribute to an individual's ability to participate in and benefit from an educational endeavor.
- In the United States, there is no proactive method for identifying physician dyscompetence; they are primarily identified through peer review or regulatory processes.

environment, long-term plans for maintenance of educational activity, and repeated monitoring and assessment of performance level.

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