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# Organizational Diagnosis: An Evidence-based Approach

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**ABSTRACT** *Organizational diagnosis plays a critical role in organizational change initiatives in terms of both choosing appropriate interventions and contributing to readiness-to-change within an organization. Although numerous authors identify diagnosis as an integral component of the change process and many have recommended specific theories and models that should be used in diagnosis, little attention has been given to the diagnostic process itself. The lack of rigour in the diagnostic process and the misdiagnoses that follow are likely to be significant factors in the high failure rate of change initiatives reported in the literature. This article reviews evidence-based diagnosis in engineering and medicine, summarizes the basic steps found in those diagnostic processes, identifies three cause–effect relationships that underlie evidence-based diagnosis, and suggests four spheres of knowledge that must intersect to guide the diagnostic process. Based upon that review, an evidence-based approach is proposed for organizational diagnosis with the goals of bringing more scientific rigour to the diagnostic process, improving the appropriateness of interventions chosen for a given situation and contributing to readiness-to-change among organizational members. Finally, specific steps are recommended for advancing the state of organizational diagnosis in the field of organization development and change.*

**KEY WORDS:** Organizational diagnosis, organization development, change management, evidence-based diagnosis, organizational diagnosis model

## Introduction

Today's changing economic, social and political environments are responsible for rapid and often radical change in organizations. The importance of skilfully determining the direction for organizational change cannot be overstated.

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Organizational diagnosis is the critical first step in planning change interventions (Burke, 1994; Spector, 2007). Failure to develop appropriate strategies for change can reduce organizational effectiveness, waste limited resources and, in extreme cases, result in organizational decline and collapse. Organizational diagnosis is critical to understanding organizational problems, identifying the underlying causes and selecting appropriate interventions regardless of whether the change process is planned or emergent. In the absence of a rigorous diagnostic process, consultants and organizational leaders are likely to address the wrong problems and/or choose the wrong solutions (Meaney and Pung, 2008). Organizational diagnosis also plays a role in influencing readiness-to-change within organizations (Armenakis *et al.*, 1993; 2007; Armenakis and Harris, 2009). Together, errors in diagnosis and the failure of employees to embrace the need for change are likely suspects in the general lack of success of change initiatives reported in the literature (Balogun and Hailey, 2008; Beer and Nohria, 2000; Meaney and Pung, 2008).

Unfortunately, the definition and application of organizational diagnosis often are misconstrued and misused. Beer (1971) described organizational diagnosis as three different data collection methods (specifically observations, interviews and questionnaires), thus using the terms diagnosis and data collection interchangeably. Decades later, our understanding of organizational diagnosis has not advanced. Lundberg (2008) noted that ‘much of the OD literature simply side-steps defining diagnosis or defines it in idiosyncratic ways’ (p. 139). He describes the variety of conceptualizations of organizational diagnosis that are in use today, indicating little if any consensus on either the definition of diagnosis or the processes involved.

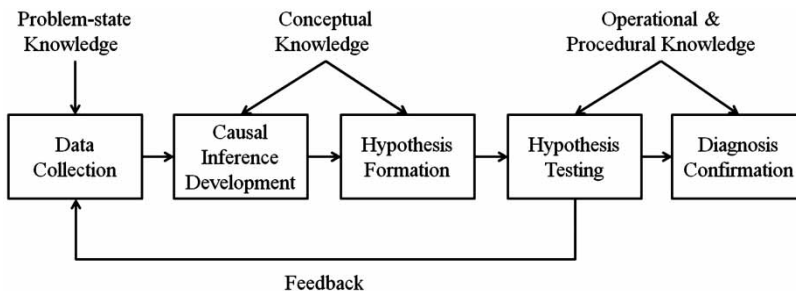
The purpose of this article is twofold. First, to clearly define the diagnostic process in order to distinguish it from other action research functions with which it has been equated or confused. Second, to propose an evidence-based approach for organizational diagnosis with the goals of bringing more scientific rigour to the diagnostic process, improving the appropriateness of interventions chosen for a given situation and contributing to readiness-to-change among organizational members. To achieve those goals, the study begins by exploring evidence-based models of diagnosis from engineering and medicine to identify the steps in the diagnostic process and the scientific underpinnings of evidence-based diagnosis. According to Rousseau, Manning and Denyer (2008), an evidence-based approach is designed ‘to assemble and interpret a body of primary studies relevant to a question of fact, and then to take appropriate action based upon the conclusions drawn’ (p. 476). The steps in medical diagnosis are then used together with the supporting aspects of medical training and practice as a framework for describing and assessing the current state of organizational diagnosis. Next, the article explores the critical roles of symptoms, causes, treatments and cause–effect relationships among those three elements in the process of diagnosis. The authors then conceptualize an evidence-based approach to organizational diagnosis that integrates four factors: symptoms, systems, standards and solutions, and finally propose specific steps to advance the application of evidence-based diagnosis in selecting and implementing organizational change initiatives.

### Defining the Diagnostic Process: Insights from Engineering and Medicine

In engineering and medicine, the term ‘diagnosis’ is used in two different ways: the process by which a situation is analysed versus the identified cause of the situation. Lundberg (2008) notes the same distinction for organization development and change (OD&C) and refers to ‘analytical understanding’ and ‘issue identification and clarification’ (p. 139). For the purpose of this article, diagnostic process refers to the former, i.e. the analysis process, and diagnosis refers to the latter, i.e. the underlying cause of the situation. Both engineering and medicine have sought to develop systematic, formal diagnostic processes. In engineering, the diagnostic process tends to be equated to problem solving, that is, analysing the functioning of a system (e.g. an engine or electronic device) or determining the cause of failure in a system. Raphael and Smith (1998) define the diagnostic process in engineering as ‘the activity whose goal is to identify the cause of an observed effect’ (p. 112). Qu and Hu (2005) describe the engineering diagnostic process as an inferential, general problem-solving process that involves three forms of knowledge: conceptual knowledge (theory and cause–effect models), problem-state knowledge (symptoms) and operational and procedural knowledge (testing and research methodologies). They also indicate that the engineering diagnostic process requires knowledge of the normal ranges for any quantitative standards that are to be applied during the diagnostic process.

The engineering diagnostic process (see Figure 1) can be summarized as consisting of the following steps: collection of data, development of causal inference(s), formation of hypotheses, testing of hypotheses and confirmation of the diagnosis. In accordance with general problem-solving processes, a feedback loop is included from hypothesis testing back to data collection. The diagnostic process is conducted within the context of a model of the phenomenon under study, whether or not that model and its assumptions are explicit in the diagnosis. The model provides the cause–effect relationships by which causal inferences are developed and hypotheses are formed and tested.

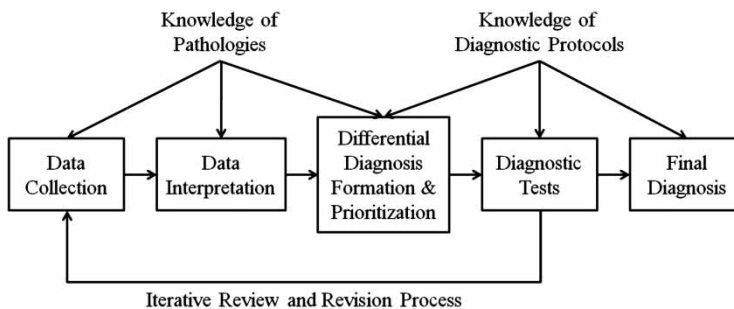
The medical diagnostic process is performed by medical practitioners when dealing with pathology, i.e. the determination of the disease or condition that is manifested by a patient’s symptoms. White and Griffith (2010) describe the medical diagnostic process as a heuristic used to determine the nature of a person’s disease and provide a model of how the diagnostic process fits into the



**Figure 1.** Model of the engineering diagnostic process.

overall treatment of a patient's condition. Stern *et al.* (2010) provide a detailed description of nine critical steps in the medical diagnostic process: (1) data acquisition (patient symptoms and history, physical examination and preliminary laboratory tests); (2) accurate problem representation (clinical problems identified for evaluation); (3) differential diagnosis (hypothesized possible causes); (4) prioritization of differential diagnoses; (5) tests of hypotheses (further diagnostic tests); (6) review and reprioritization of the differential diagnosis on the basis of the new data; (7) revision of the differential diagnosis; (8) testing the revised differential diagnosis; and (9) confirming a final diagnosis. Their detailed diagnostic framework can be simplified by combining related steps into a five-step process: (1) data collection; (2) data interpretation; (3) differential diagnosis formation and prioritization; (4) diagnostic tests; and (5) final diagnosis with feedback that represents the iterative revision process represented by Stern *et al.*'s (2010) steps 6, 7 and 8 (see Figure 2). Each of these steps is conducted within the scope of extensive bodies of knowledge, i.e. knowledge of pathologies. Stern *et al.* (2010) identify four frameworks that are useful in medical diagnosis: anatomic pathology (study of organs, tissues and entire bodies), organ system pathology (study of human systems such as cardiovascular, endocrine and renal), physiological pathology (study of normal physical, biochemical and mechanical functions of the body) and mnemonics (e.g. acronyms used to organize and recall medical procedures). Applications of this diagnostic process can be found in diagnostic protocols published by sources such as the National Guideline Clearing House of the US Department of Health and Human Services ([www.guidelines.gov](http://www.guidelines.gov)) and the US Preventive Services Task Force ([www.uspreventiveservicestaskforce.org](http://www.uspreventiveservicestaskforce.org)).

The formal diagnostic processes in engineering and medicine are built upon the basic components of data collection, hypothesis formation and hypothesis testing. Symptoms are observed, interpretations are formed, hypotheses are proposed, tests of hypotheses are conducted and final diagnoses are made. However, whereas the engineering diagnostic process typically focuses on objective, quantifiable data, the medical diagnostic process involves both objective and subjective (often self-reported) data. In addition, the causes of engineering problems are likely to follow strict engineering and mathematical principles, but the relationship between medical symptoms and diagnosis are more probabilistic. Lerner (1969) indicates that engineering and medicine share a common trait: classifying situations



**Figure 2.** Model of the medical diagnostic process.

is much more difficult when the symptoms are not fully established or observable, thus making engineering and medical diagnoses subject to interpretation by intuition and expert experience. The same can be said for organizational diagnosis.

In summary, the fields of engineering and medicine provide well-defined, evidence-based models of the diagnostic process that bring scientific rigour to the applied disciplines of engineering and medicine. Although both models are similar in their emphasis upon the formal development and testing of hypotheses, the medical diagnostic process seems more aptly suited as a model for the organizational diagnostic process. Like the medical diagnostic process, the organizational diagnostic process deals with objective and subjective data and involves wide-ranging spheres of knowledge that limit the ability of any one practitioner to be fluent with all of the data and knowledge relevant to the diagnostic process. The breadth of knowledge required in medical practice demands both extensive formal education (e.g. 10 or more years of undergraduate and graduate coursework), specialization in an intended field of practice (e.g. family or internal medicine) and a variety of professional support systems (e.g. medical journals, digital assistants and organizations such as The Cochrane Collaboration that collect and synthesize medical research for use by medical practitioners) to achieve effective medical diagnosis and treatment. Given that the organizational diagnostic process arguably deals with at least as broad a range of issues as the medical diagnostic process, the aspects of the medical diagnostic process that make knowledge available and accessible to practitioners also are relevant to developing and implementing a formal process of organizational diagnosis.

Lundberg (2008) discusses the use of the medical diagnostic process as an analogy for the organizational diagnostic process. He notes some parallels between the two processes: collecting data to clarify symptoms, interpreting that information by comparing it to existing models, naming the diagnosis, and then prescribing a treatment. However, he also notes what he believes to be two fundamental differences. First, the medical diagnostic process begins with ill health that prompts a visit to the doctor. This implies that the medical diagnostic process is a reactive one. Of course, this ignores the proactive practices of such things as well-baby visits and annual check-ups. Second, medical professionals apply a model of 'normal health' based upon research and norms or standards for comparison. The notion that doctors apply these accepted models of health also implies that the knowledge, which often includes protocols for the diagnostic process, has been successfully disseminated and that doctors have been trained in its application. We believe the organizational diagnostic process as practised today runs counter to the evidence-based diagnostic process in medicine, and that current practices are not the foundation for effective organizational diagnosis. An over-reliance upon concepts, methods and practices that offer little more than anecdotal claims of efficacy illustrates the deficiencies of organizational diagnosis as practised in the field of OD&C today.

### **Developing Evidence-based Diagnosis: Lessons from the Field of Medicine**

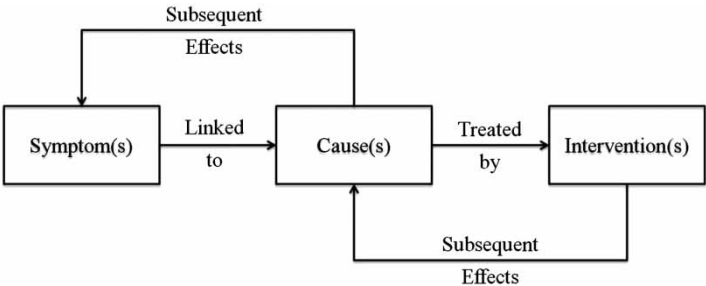
The evolution of the field of medicine offers considerable insight and guidance for the development of an evidence-based organizational diagnostic process.

Medicine evolved from a variety of unfounded medieval practices to present-day evidence-based diagnosis and treatment through the steady advance of science that informs and guides practice. For example, research disproved the belief that ‘bad’ blood was the cause of many illnesses by proving that the assumed causal links between symptoms and cause (e.g. illness results from bad blood) and between treatment and cause (i.e. removing blood cures the illness) were erroneous.

Medical diagnosis benefits from a long history of evidence-based research and practice, which produced the critical components of an effective diagnostic process depicted in Figure 3. Medical research established the cause–effect relationships among many symptoms and their underlying causes, the cause–effect relationships among many illnesses and their treatments and the cause–effect relationships among many treatments and subsequent changes in symptoms, including treatment side effects. These causal relationships can be complex and even confusing, but they provide essential guidance to the medical practitioner. Consequently, the medical community has established procedures for identifying and treating many illnesses. Although medical knowledge is neither complete nor infallible, all three of these components are far more advanced in medical diagnosis than in organizational diagnosis.

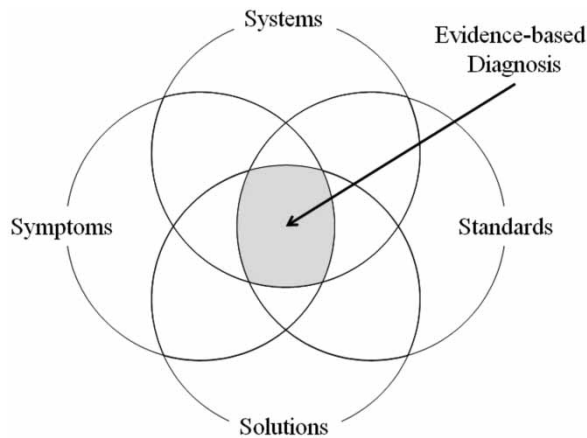
The establishment of these evidence-based causal links resulted from persistent and intense interaction between research and practice to advance four spheres of knowledge shown in Figure 4. The *knowledge of symptoms* represents the cataloguing of patient symptoms and developing systematic methods for detecting and measuring those symptoms. With the accurate detection and recording of symptoms comes the ability to identify patterns of symptoms that are associated with specific diseases and syndromes. Today, medical personnel, as well as the public at large, can work from diagnostic databases that help to identify potential medical conditions from patterns of symptoms.

The *knowledge of systems* represents a deep understanding of human systems (e.g. human anatomy and physiology), the components of each of those systems, the interactions among the components of each system, the interdependencies among the various human systems and the impact of environmental factors upon those systems. Of course, early models of human systems were inaccurate, as illustrated by the early belief that the heart was the locus of human emotion. Eventually through persistent study, the components of the human



**Figure 3.** Components of the diagnostic process.





**Figure 4.** Spheres of knowledge and their integration.

system were identified, and advances in science revealed the functions of and relationships among those components. Through this accumulation of systems knowledge, medical practitioners gained the ability to diagnose when the components of bodily systems are not functioning appropriately or effectively.

The *knowledge of standards* or 'norms' for bodily functions evolved from three developments. First, methods for measurement had to be developed. For example, considerable effort was devoted to developing a reliable thermometer (cf. *Who Invented the Thermometer*; <http://www.brannan.co.uk/pages/thermometers/invention.html>). Second, once reliable measurements existed, the field of medicine could proceed to identify norms for the human body, e.g. standards for body temperature and blood pressure. Third, once norms were developed, the field could sort observed variations into random versus systematic variation as a step toward developing standards that indicate what systematic variations in measurements (i.e. symptoms such as high body temperature) were associated with what causes (i.e. illnesses). In keeping with the fundamental principles of open system theory, these norms are grounded in a host of contextual factors rather than being absolutes. For example, body temperature, for which we have a norm of 98.6 °F (37 °C), is known to vary by age, by time of day, by dress and by ambient environmental temperature among other things. Adult body temperatures vary daily from 97 °F (36.1 °C) between 4:00 and 6:00 a.m. and 99 °F (37.2 °C) between 6:00 and 8:00 p.m. The norms for human systems continue to evolve over time with advances in both technology and medical research.

Finally, the *knowledge of solutions* evolved from research, clinical practice and field trials with potential treatments and medications. Early treatments often were based upon folklore or superstition. Carrying posies or other fragrant flowers, for example, was thought to be effective in warding off the 'bad air' to protect people from the Black Death in the 14th century. Science eventually displaced such beliefs, but the progress was not always smooth and linear and often was serendipitous (e.g. the discovery of penicillin). Progress was made by exposing existing treatments to scientific tests and conducting field trials on potential treatments



suggested by research. For example, consider the debate over the effectiveness of drug therapy in treating children with attention deficit hyperactivity disorder (Vendantam, 2009). The hallmark of the process was the extensive collaboration among researchers and practitioners in testing and continuously improving potential treatments and cures. The knowledge of symptoms, systems and standards supported the development of the knowledge of solutions, thus forming the comprehensive and integrated bodies of knowledge that are studied and practised by medical professionals today.

Medical researchers and practitioners collaborated in evidence-based research and practice to advance the field of medicine beyond medieval times. Independent, less collaborative work likely would have limited the advancement of knowledge in each sphere as well as their integration. Smaller spheres of knowledge would result in a smaller area of potential integration. The practice of diagnosis would not have advanced as far or as fast without both the expansion and integration of the spheres of knowledge established through evidence-based research and practice. Such practice has produced evidence-based models of diagnosis and intervention for a variety of conditions such as methicillin-resistant *Staphylococcus aureus* (<http://health.state.ga.us/pdfs/publications/manuals/mrsa.pdf>), myocardial infarction ([http://www.osalghamdi.com/omar/MDI207\\_Final\\_Project.pdf](http://www.osalghamdi.com/omar/MDI207_Final_Project.pdf)) and breast cancer ([http://ec.europa.eu/health/ph\\_projects/2002/cancer/fp\\_cancer\\_2002\\_ext\\_guid\\_01.pdf](http://ec.europa.eu/health/ph_projects/2002/cancer/fp_cancer_2002_ext_guid_01.pdf)). These guidelines result from research informing practice as described by Rousseau *et al.* (2008): ‘A systematic synthesis musters the full and comprehensive body of available evidence to provide the best available answer to a question of interest’ (p. 478). This description aligns with the Cochrane Collaboration’s definition of evidence-based medicine as: ‘The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research’ (*Evidence-based Health Care*; <http://www.cochrane.org/about-us/evidence-based-health-care>).

Medical advances also required a means for communicating medical knowledge systematically to practitioners in the field. As medical knowledge evolved over time, concepts and models moved in and out of the spheres of knowledge. Gradually, evidence-based knowledge replaced hunch and supposition. In order to share the evolving body of knowledge, medical educators and practitioners sought affiliation with universities to provide a means for educating future practitioners. For example, universities in Paris, France and Padua, Italy offered studies in medicine as early as the 12th and 14th centuries, respectively.<sup>1</sup>

In summary, experience from the evolution of the field of medicine suggests that development of a rigorous, evidence-based diagnostic process takes time and requires four conditions:

- an understanding of the causal relationships among symptoms, causes and solutions must develop;
- the knowledge of symptoms, systems, standards and solutions must grow and become integrated;
- researchers and practitioners must collaborate to establish evidence-based practice;

- a systematic process for disseminating relevant knowledge through formal education must be established.

Evidence-based diagnosis in turn improved the success rate of medical treatments and increased the readiness of both medical practitioners and patients to accept those treatments. However, one critical caveat must be noted. Despite the advanced state of medical knowledge and practice, mistakes continue to be made. In his book *How Doctors Think*, Groopman (2007) identifies a variety of factors that contribute to errors in diagnosis, such as jumping to conclusions, second-hand sources of symptoms and the human tendency to search for something that is present rather than search for something that is not. Gorovitz and MacIntyre (1976) propose a theory of medical fallibility in which they contrast the influence on doctors' decisions and actions stemming from internal norms derived from the pursuit of scientific knowledge versus external norms derived from ambition and a desire to do good things. They also note the potential for error as medical science moves from a collection of specific instances to a generalization and then applies that generalization to a specific case. Overall, fallibility in medical practice can originate with either the people or the process involved. The medical profession attempts to reduce mistakes through a variety of means, such as research protocols, medical school accreditation, and medical licensure and review.

### **Assessing the Current State of Organizational Diagnosis**

Just as the diagnostic process is critical to the practice of medicine, the organizational diagnostic process is critical to effective organizational change. A systematic, evidence-based diagnostic process is needed to ensure that problems are identified accurately and appropriate actions are prescribed. This is true whether the approach to organizational change is planned, in which case the goals and the steps are identified in advance, or emergent, in which case organizational change occurs over time as a result of a series of incremental actions (Burnes, 2004). As Bamford and Forrester (2003) note, even emergent change requires 'reaching an actual understanding of the complexity of the issues involved and identifying the range of possible options' (p. 548). Nevertheless, despite its critical role in OD&C, the organizational diagnostic process does not appear to be well-defined, understood or consistently applied in organizational change initiatives (Lundberg, 2008; O'Neil, 2008).

The published literature on OD&C provides a wide variety of definitions of the diagnostic process, but generally fails to offer a clear description of exactly what constitutes organizational diagnosis or how it is to be conducted. As Lundberg (2008) notes, 'perhaps most surprising of all is that the OD&C research literature neglects diagnosis' (p. 13). Spector (2007) offers one of the more complete explanations of the diagnostic process and defines diagnosis as 'learning what needs to be changed and why' (p. 46). He identifies four steps in diagnosis: 'collecting data', 'dialogue of discovery', 'feedback' and 'institutionalizing dialogue and diagnosis' (p. 56). Spector's explanation is important because it stresses the

identification of cause and effect and recognizes that data collection is just one step in the diagnostic process.

Books and chapters that focus on organizational diagnosis often confuse a model of an open system, such as Weisbord (1976) or Burke and Litwin (1992), with the diagnostic process itself (Noolan, 2006). System models are not models of a diagnostic process, but rather they provide guidance *during* the diagnostic process. For example, Harrison (2005) describes the role of open system models as helping practitioners 'choose topics for diagnosis, develop criteria for assessing organizational effectiveness, gather data, prepare feedback, and decide what steps, if any, will help clients solve problems and enhance effectiveness' (p. 27). System models are extremely relevant to the change process in general and to diagnosis in particular.

The open system concept, as abstract as it might be, is a fundamental and widely accepted principle among organizational change professionals. Harrison (2005) describes the open system concept as providing some important ideas for use in organizational diagnosis: an open system is composed of interdependent components, the components interact, effectiveness is a function of organizational adaptation to the environment and people are a vital system resource. Harrison (1987) describes the open system concept as an abstraction that is applicable to any kind of organization and to all levels of an organization. Although the authors agree that the principles of the open system concept are critical to the diagnostic process, the abstract nature of the concept has led to a proliferation of open system models that often are not well defined. Consequently, practitioners and academics alike must recognize these models for what they are, i.e. conceptual and not evidence-based. Many authors offer their versions of open system models, but they provide no scientific support for the validity and generalizability of their models. At best, authors provide *post hoc* accounts of their applications of system models in specific change situations. Because system thinking is fundamental to an effective diagnostic process, OD&C professionals would be well served to return to the principles of open systems as detailed by Katz and Kahn (1978) who developed the conceptual underpinnings of an open system view of organizations. Open system principles should guide the diagnostic process, rather than any one of the unsupported collections of boxes and arrows that pass for system models today.

In addition to the confusion over what constitutes the organizational diagnostic process, the practice of organizational diagnosis suffers from serious deficiencies in all four of the conditions that advanced evidence-based diagnosis in medicine: understanding causal relationships; knowledge of symptoms, systems, standards and solutions; collaboration among researchers and practitioners; and dissemination of relevant knowledge. Limited research exists on the causal relationships among symptoms, causes and solutions; where it does exist, generalizability across organizations has not been demonstrated. Although the knowledge sphere for solutions (e.g. interventions) seems quite large, that knowledge typically focuses on how to conduct interventions rather than demonstrates scientific evidence for the efficacy of those interventions or the appropriateness of one intervention over another in specific situations. In addition, the knowledge spheres for symptoms, systems and standards have been neither systematically developed nor

integrated with the knowledge sphere for solutions. The connections between organizational change researchers and practitioners are limited at best, and no standardized, evidence-based curriculum exists for training individuals in organizational diagnosis. Of course, training people in organizational diagnosis would require an established diagnostic process, which currently does not exist. Medical diagnosis, by contrast, consists of established procedures and devices for measuring symptoms (e.g. the thermometer and sphygmomanometer), an understanding of physiological systems and their interrelationships (e.g. the components and interrelationships of the skeletal and muscular systems and the potential impact of external factors on these systems), established standards of health (e.g. norms for body temperature and blood pressure under various conditions) and documented solutions (e.g. vaccines that prevent polio and procedures for successful organ transplants).

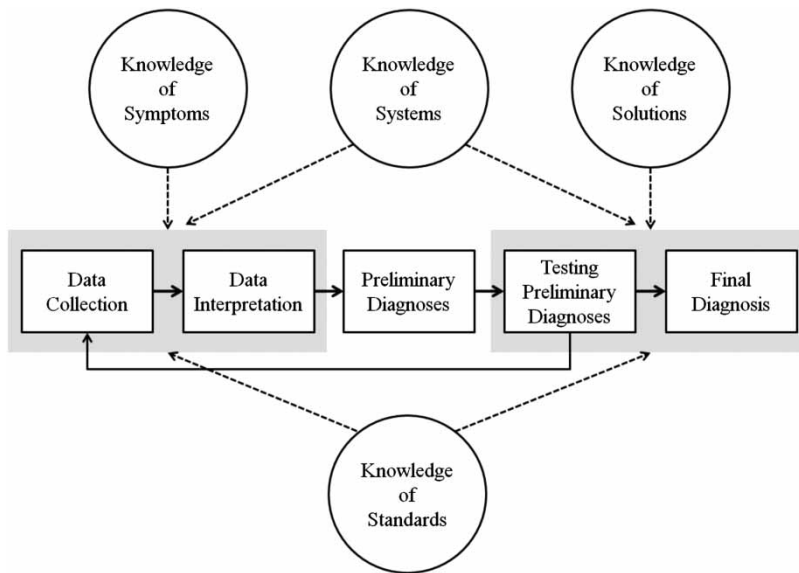
In contrast to the field of medicine, OD&C lacks a systematized, evidence-based body of knowledge comprised of symptoms, systems, standards and solutions. The field also reveals little evidence of collaboration among researchers and practitioners. At best, the field of OD&C is characterized by disorganized, haphazard methods for educating people in the field. Currently, the organizational diagnostic process lacks the evidence-based approach required for informing and guiding the change process. This lack of evidence-based research and practice contributes to a lack of credibility for OD&C, which likely is a significant factor in what authors have noted as the declining importance of OD&C to organizational leaders (Burke and Bradford, 2005). The poor state of evidence-based organizational diagnosis is best summarized by Lundberg (2008):

Although perhaps we shouldn't expect too much from definitions of OD diagnosis, available definitions do leave much unclear, such as whether diagnosis is a descriptive or prescriptive activity, what is a problem, what might be the time frame for diagnosis, what methods are involved in diagnosis, what constitutes valid information or what amount or scope of information or data is appropriate, how conceptual models are to be used, and significantly, who does a diagnosis. (p. 139)

### **Proposing a Model of an Evidence-based Organizational Diagnostic Process**

As a first step in advancing the research and practice of organizational diagnosis, a commonly accepted and useful model of organizational diagnosis is needed. Figure 5 presents a model of organizational diagnosis that is analogous to the diagnostic process in medicine: data collection (symptom identification), data interpretation (synthesizing symptoms), preliminary diagnoses, testing preliminary diagnoses and final diagnosis. The model includes a feedback loop from the testing of preliminary hypotheses to data collection to represent the same iterative process as portrayed in the diagnostic model for medicine.

The first step in the organizational diagnostic process is the collection of subjective and objective data pertaining to the organization's situation in order to identify symptoms. These data represent the symptoms of underlying organizational issues and can come from a variety of sources. Some of the symptoms likely will be reported, unsolicited, by the client or other interested parties. Other data



**Figure 5.** Model of an evidence-based organizational diagnostic process.

will have to be sought from sources such as formal interviews, requests for previously administered assessments and reviews of organizational archives. Just as medical professionals must not accept self-reported symptoms at face value, the organizational diagnostician also must consider the source and the context within which the data were offered or collected. Additional data likely will be needed to corroborate or challenge self-reports and to build toward a more comprehensive assessment of symptoms that are illustrative of unhealthy or unproductive employees and organizations. Levinson (2002), for example, includes 15 checklists that suggest an extensive list of information that could be gathered during organizational diagnosis.

The second step is the interpretation of these data in order to synthesize patterns among the symptoms and organizational outcomes. For example, Katzell and Thompson (1990a, 1990b) developed an integrated model of the causal relationships among work attitudes, motivation and performance based upon established theories and empirical evidence. Their integrated model provides both a heuristic for diagnosing organizational problems and suggests specific interventions for improvement. Cameron and Quinn (2005) did much the same for the concept of organizational culture. They developed a model of the constructs associated with organizational culture and conducted extensive research to establish the empirical relationships among the variables, develop standardized instruments for the measurement of those variables, establish norms for organizational comparison on those variables and identify appropriate interventions for changing organizational culture.

Behavioural science research provides insights into the observed relationships among organizational symptoms (e.g. attitudes, behaviour and results). In turn, these known relationships provide clues as to the potential causes of observed

symptoms and likely relationships with other constructs that might be useful in verifying a diagnosis. This knowledge should guide practitioners in their search for evidence of potential causal factors and collateral effects. Unfortunately, the efforts to incorporate such research into organizational diagnosis have been limited. Weisbord (1978) made a fledgling attempt to integrate theories into his 20-step guide to organizational diagnosis. However, many of the theories incorporated in his book, although popular at the time, proved to lack the critical empirical support necessary to be truly useful in diagnosis. Other authors have made efforts to incorporate existing theory into organizational diagnosis. For example, Harrison (2005) uses Hackman's (1987) model of team effectiveness to diagnose team performance, and Levinson (2002) builds a strong case for the role of theory, specifically embedded intergroup relations theory, in organizational diagnosis.

The third step is to use the patterns discovered in the data to form initial hypotheses, i.e. possible preliminary diagnoses, regarding the organizational issue(s) being investigated. As with a scientific hypothesis, the diagnosis consists of a predicted relationship between one or more independent variables (causes) and one or more dependent variables (effects). An evidence-based approach to organizational diagnosis calls for these hypotheses to stem from formal theories and models that have evolved from empirical support refined through practice and experience. In contrast, the current state of organizational diagnosis often follows implicit models that have evolved from personal experience or explicit models that are conceptual and unverified. Armenakis *et al.* (1990) review three heuristics (availability, representativeness and anchoring) that demonstrate how personal experience can bias the inference process and impact the accuracy of diagnoses.

The fourth step in the organizational diagnostic process involves the testing of the preliminary diagnoses, which medical professionals refer to as the differential diagnosis. The testing of an organizational diagnosis typically takes one of two forms. The diagnostician might review a timeline of organizational events to determine whether current symptoms were in fact preceded by the predicted causes and, if appropriate data exist, to test the empirical relationships between causes and subsequent effects. If empirical tests are not possible, the diagnostician might rely on subjective information through interviews or secondary sources that show patterns consistent with a causal linkage. Of course, tests of the preliminary diagnosis might result in disconfirmation, which would necessitate a revision or rejection of the preliminary diagnosis.

As with the scientific process, organizational diagnosticians must be aware of the pattern and strength of the relationships between independent and dependent variables as well as potential moderating and intervening variables. Statisticians speak of explained variance and error variance, i.e. variance in the criterion variable that is accounted for and not accounted for by the predictor variable, respectively. Reducing error variance might require improved measurement accuracy, the measurement of additional variables or both. Statisticians also warn of the difference between correlation and causation. Because organizational diagnosis often involves the use of cross-sectional data from surveys, diagnosticians must be aware of the limitations of such data in establishing causality and carefully consider whether the models and theories used for interpreting such data are robust to those limitations.



Ultimately, the testing of the preliminary diagnoses results in an understanding of the potential cause–effect relationships at work in the organization through an iterative process of hypothesis formation, hypothesis testing, revision of hypothesis and testing of the revised hypothesis until the hypothesis is supported. This process is represented by the feedback loop shown in Figure 5. In medicine, this is referred to as moving from the differential diagnosis to the final diagnosis. Competing explanations are eliminated from consideration, and a final diagnosis emerges. The final diagnosis can involve multiple factors, which the practitioner must then take into account and prioritize in formulating organizational interventions or treatments. The final diagnosis includes a prognosis, i.e. a statement of the probable results of intervening or not intervening in the organization and the alternative interventions to be considered. A prognosis is essential if a client is to weigh the costs against the potential benefits of the proposed intervention(s).

### Supporting Organizational Diagnosis with Four Spheres of Knowledge

In order for a diagnostic process to be effective, it must be supported by four spheres of knowledge: symptoms, systems, standards and solutions. Just as medical professionals must know their patients' *symptoms*, understand the functioning and interdependencies of human *systems*, know the established *standards* that define what it means to be healthy, and possess knowledge of a wide variety of medical *solutions*, similar understandings are required of organizational diagnosticians. Importantly, each sphere of knowledge represents only one part of the diagnostic puzzle. As in the process of medical diagnosis, the advancement of organizational diagnosis will benefit from the expansion of the individual spheres of knowledge and the integration of that knowledge through evidence-based research and practice.

The knowledge of *symptoms* involves the detection, description and assessment of the current state of the organization and its members. The medical analogy is the medical professional asking a predefined set of relevant questions of the patient and taking measurements such as temperature, pulse rate and blood pressure. In the case of the organizational diagnostic process, the assembly of symptoms often begins with organizational members noting organizational anomalies or dysfunctions such as high levels of employee turnover, low scores on organizational climate surveys, declines in the quantity or quality of performance or ineffective communication. The diagnostician must investigate the ostensible symptoms as well as seek out less obvious (or even hidden) symptoms, assess the qualitative and quantitative symptoms with appropriate methods, integrate and summarize the assessed levels of the symptoms and form a preliminary diagnosis. The diagnostician then feeds back the information to members of the organization, cautions that a preliminary diagnosis might require additional study to confirm and maps out the next steps in the diagnostic process.

The knowledge of *systems* involves investigation of the relevant components of the organizational system, the nature of the relations among those components and any relevant interdependencies with the organization's environment. Medical professionals must understand how the various systems in the human body interact, how changes in one system might affect other systems and how those systems



might be affected by external factors such as environmental contaminants, physical and mental stressors, and medical interventions. Similarly, organizational diagnosticians must understand the connections among organizational subsystems and how both symptoms and interventions might cut across related subsystems within an organization. Conditions in one subsystem might reverberate through related subsystems or, conversely, might emanate from a lack of fit among other related subsystems.

Practitioners have relied on open system models since the emergence of the socio-technical system model (Trist and Bamforth, 1951) and subsequent elaborations (cf. Burke and Litwin, 1992; Harrison, 2005; Leavitt, 1965; Margulies and Adams, 1982; Nadler and Tushman, 1980; Tichy, 1983; Weisbord, 1976). Unfortunately, open system models remain essentially conceptual, with little or no empirical support to demonstrate the appropriateness of one model over another. Katz and Kahn (1978) note that the application of system models to organizations is made more problematic by the contrived nature of social structures, i.e. social structures are attempts to describe and associate events and behaviours. They note that 'People invent the complex patterns of behavior that we call social structure, and people create social structure by enacting those patterns of behavior' (p. 37). Unlike a biological system such as the human body, a social system disappears when it ceases to function. Consequently, the subsystems of an organization cannot be physically verified as is the case with human anatomy.

Katz and Kahn (1978) propose five major organizational subsystems: production/technical, supportive, maintenance, adaptive and managerial. Also, in contrast to many open system models, Katz and Kahn (1978) offer a comprehensive depiction of an organization's external environment including five environmental sectors (social, political, economic, informational/technological and physical) and four environmental dimensions (stability/turbulence, uniformity/diversity, clustered/random and scarcity/munificence). Other management scholars such as Porter (1998b) and Bensoussan and Fleischer (2009) have provided models for analysing organizational environments upon which organizational diagnosticians can draw. Overall, the extensive conceptual development involved in Katz and Kahn's (1978) approach to modelling a social system, complete with the influential nature of its external environment, makes their work an excellent starting point for establishing a consensus open system model to guide research and practice for the foreseeable future.

The knowledge of *standards* involves specifying the desired state-of-affairs for key measures of employee and organizational health and performance and then comparing the organization's current levels to established standards on the same measures. The analogy in the medical profession is comparing a patient's levels on key measures against established health standards such as body temperature, blood pressure and organ functioning. This 'gap' analysis can take several forms. One form is benchmarking, in which an organization's current state or processes are compared with the organization's historical best or to the best practices among relevant comparators (cf. Denkena *et al.*, 2006). A second form is to compare an organization's scores on measures of key variables, e.g. its financial performance or employee job satisfaction, against external standards or norms for similar organizations (Balzer *et al.*, 1997; Bensoussan and Fleischer, 2009). A

third form involves comparing an organization's existing situation against internal standards such as a strategic plan or goals for profit margin or rate of return. Other examples include value chain analysis (Porter, 1998a), core competency analysis (Prahalad and Hamel, 1990) and organizational dialogics (Bushe and Marshak, 2009). These three techniques tend to be more proactive and positive in that they suggest building upon existing strengths rather than repairing existing weaknesses.

The knowledge of *solutions* involves the evidence-based study of solutions to establish their relevance to organizational issues and their subsequent impact upon measures of organizational health. The medical analogy is a physician prescribing treatment for a patient who is experiencing a condition such as high blood pressure by relying on the empirically proven list of medications to treat that condition while also taking into consideration any allergies or contextual factors that might impact the effectiveness of that drug for that particular patient. The knowledge of solutions involves more than merely cataloguing the wide variety of interventions available to organizational change agents (cf. Holman, et al., 2007). The appropriateness of organizational interventions must be determined based on rigorous study and empirical evidence rather than anecdotal claims of effectiveness. Organizational diagnosticians need to start with solutions that are empirically verified as effective in addressing specific organizational issues and then consider the specific organizational context in order to increase the effectiveness of the intervention for that organization. For example, Katzell and colleagues (cf. Guzzo *et al.*, 1985; Katzell *et al.*, 1977; Katzell and Guzzo, 1983), summarize the findings from experimental and quasi-experimental studies providing differential levels of empirical support for the effectiveness of different interventions on employee performance and productivity. More recently, Rousseau and colleagues (cf. Hodgkinson and Rousseau, 2009; Rousseau, 2007; Rousseau *et al.*, 2008) demonstrate the utility of a formalized process of systematic review to accumulate rigorous evidence on the impact of organizational interventions.

The assembly of knowledge on the nature and efficacy of OD&C interventions might prove to be a difficult and contentious process. Consultants and consulting firms might be hesitant to disclose their methods or to subject their methods to rigorous analysis. Some of this resistance would come from legitimate concerns over defining and measuring effectiveness. Making a positive impact on an organization can be extremely difficult, and the larger the organization, the more difficult achieving change can be. Concerns also might arise from exposing trade secrets that represent the competitive advantage of the consultant or firm. Governments protect such intellectual property in medicine with patents. By contrast, some of the resistance would come from having interventions exposed as ineffective. Fraud in medical practice was hard to distinguish from real medicine until early in the twentieth century. Problems with medical quackery continue to the present day. The physical and mental well-being of patients led to a variety of methods for exposing and punishing medical quackery. The impact of quackery in OD&C also has the potential for major impact upon employees as resources are wasted and jobs and lives are disrupted. As with the medical profession, the insistence upon evidence-based practice and professional education for practitioners would be important steps toward building confidence in and respect for the field of OD&C.

### **Discussion: Advancing the Organizational Diagnostic Process**

The authors believe that change practitioners can learn much from the evidence-based evolution of the field of medicine. Medicine achieved its current professional status by compiling evidence-based knowledge supported by collaboration among practitioners, educators and researchers in related fields. Organizational diagnosis also will advance through collaboration among practitioners, educators and researchers who make a similar commitment to the use of evidence-based knowledge in organizational change initiatives. The evolution of medical practice appears to have been driven by a variety of factors, not the least of which was a drive to achieve legitimacy in the eyes of society by joining with academic institutions. The field and practice of OD&C faces a similar threat to its legitimacy. Scholars have questioned whether OD&C has outlived its usefulness, become stuck in the past, or is just generally irrelevant to the rapidly changing organizing principles of the 21st century (Burke and Bradford, 2005; Weidner, 2004). Burke and Bradford (2005) state that:

... OD should be more relevant today than ever before and the observation that, by and large, executives ignore OD or relegate it to the bowels of the organization. This leads us to a crucial and paradoxical question: 'if OD is so potentially relevant, why is it often ignored?' (p. 7)

Despite the assertion by OD&C practitioners and scholars that OD&C has much to offer in terms of its humanistic values, goals of building capacity and capability into organizational systems, and focus on effectiveness, a lack of consensus on the definition and scope of OD&C works to limit the potential contributions of the field and its followers (Marshak, 2006; Waclawski and Church, 2002; Worley and Feyerherm, 2003). Waclawski and Church (2002) state that:

Unlike medicine, accounting, law, police work, national politics, and many other disciplines, professions, and vocational callings that one might choose to pursue, all of which have a clear, consistent, and focused sense of purpose, the field of OD is somewhat unique in its inherent and fundamental lack of clarity about itself. OD is a field that is both constantly evolving and yet constantly struggling with a dilemma regarding its fundamental nature and unique contribution as a collection of organizational scientists and practitioners. (p. 3)

Burke and Bradford (2005) state, 'OD practitioners for the most part are carrying out piecemeal activities using OD techniques and tools but are not involved in a system-wide change effort' (p. 9). Marshak (2005) observes:

Today most (but not all) OD practitioners find themselves left out of working at the highest levels on the major changes that have been transforming organizations and industries for the past ten to twenty years. Instead OD is viewed by a few as dead, and by many others as having become marginalized or even irrelevant to the central change issues facing CEOs of contemporary organizations. (p 19)

In order to move the organizational diagnostic process forward, change practitioners and researchers should begin to collaborate with client organizations to address the following questions:

- What symptoms are empirically and verifiably related to specific underlying organizational conditions?
- What interventions are known to treat specific underlying conditions, and what are the known side effects of those interventions?
- How should symptoms change as a function of successful and unsuccessful interventions?

Just as answers to such questions were important to medical educators and practitioners, addressing these questions is critically important to educators and practitioners in OD&C. If organizations are to solve pressing problems and achieve desired states of effectiveness, organizational leaders and change practitioners must know what 'works'. This requires collaboration on research to study symptoms, standards and solutions for improved individual, team and organizational functioning. Rather than merely adding more boxes and arrows to existing models of organizational systems, efforts must be made to synthesize the various open system models into a generally accepted model of an organization and then thoroughly explore the relationships among the subsystems and the impact of environmental factors on those subsystems. As the knowledge spheres for symptoms, systems, standards and solutions develop, they must be communicated to people in the field and taught to existing and future practitioners.

Research also will have to advance measures and measurement for organizational change. Just as development and acceptance of the thermometer was necessary to establish the norm of 98.6 °F for body temperature, standardized and accepted measures of organizational phenomena must be developed before standards for organizational functioning can be established. Dependable measures of organizational phenomena with known characteristics and established norms (cf. Cook, et al., 1981) would go far in advancing organizational diagnosis.

In summary, the following are key components that would advance an evidence-based organizational diagnostic process:

- established, accepted methods and measures for diagnosis, including a commonly accepted model of organizational diagnosis;
- accepted and quantifiable norms for assessment;
- clearly defined system components and knowledge of those subsystems' interactions;
- known cause–effect relationships among symptoms and causes;
- known cause–effect relationships among causes and treatments (interventions);
- known cause–effect relationships among treatments (interventions) and changes in organizational symptoms and the symptoms of successful and unsuccessful intervention.

Although the list of key components might seem daunting, the evolution of the field of medicine is instructive. Medical practice lacked these components as well

but has continued to build them over time. Just as was the case in the field of medicine, OD&C has evidence-based research upon which to build. For example, the work by Hackman and Oldham (1980) on task design, Cameron and Quinn (2005) on organizational culture, Katzell and Thompson (1990a) on an integrated model of work motivation, Guzzo *et al.* (1985) on a meta-analysis of effective interventions and Balzer *et al.* (1997) on job satisfaction demonstrate the ability to develop measures, identify norms and establish cause and effect relationships through intensive and extensive research in an area of inquiry. A cataloguing of such work similar to the model of systematic review championed by Rousseau *et al.* (2008) would help move the process of organizational diagnosis toward more evidence-based practice. These recommendations would permit the field of OD&C to move beyond its current state of arrested development. Keeping in mind that the field of medicine began from even weaker scholarly roots than OD&C, it has advanced quite dramatically over a long period through a commitment to evidence-based practice, formalized collaboration among academics and practitioners, and professional education. The field of OD&C should benefit significantly as a more rigorous scientific-based discipline if it were to follow a similar path of evolution.

The authors believe that developing a more rigorous diagnostic process in OD&C requires four steps. The critical first step is to formalize the organizational diagnostic process and to base it firmly on the scientific process: data collection, hypothesis formation and hypothesis testing, as described in Figure 5.

The second step is to build the knowledge base that begins to answer the questions concerning cause and effect among symptoms, causes and interventions. In order to do so, research and practice must identify accepted measures for assessing organizational 'health' and establish accepted and empirically measurable norms for 'healthy' organizations. Although significant accomplishments have been achieved in this regard, much remains to be done. Efforts can build on the cataloguing of measures that has been done to date (cf. Cook *et al.*, 1981; Fields, 2002; Price and Mueller, 1986) and establish accepted methods, procedures and norms for assessing key organizational phenomena.

Third, OD&C must look beyond existing open system models as guides for organizational diagnosis. The existing models are conceptual, not empirical. Over time, a model of organizations must be built through research and tested via evidence-based practice. The relationships among organizational components and between the organization and its environment must be researched and established in order for the model to be useful in organizational diagnosis. The external environment also must be explored and incorporated so that the 'open' aspect of the open system approach can become meaningful to the diagnostic process.

Finally, in order for these efforts to be successful, a strong collaborative relationship must be established among the teaching, research and practice communities involved in OD&C. The field of medicine is characterized by strong working relationships among those who research and teach in the field, those who practice and the communities that they serve. In medicine, the collaboration between research and practice created the common body of knowledge that is taught today. Medical students study the science and the practice of medicine; the same should be true for those who seek to become OD&C professionals.

Bringing more rigour to the organizational diagnostic process will not be easy and will require time and collaborative efforts on the part of academics and practitioners. The complex nature of modern organizations and the complicating factor of the human element often make the practice of organizational change seem more like an art than a science. However, organizational change educators and practitioners must shift the balance between the artistry of intervening in an organization and the science that underlies the process. Because of the complexity of an organizational system and its interdependence with a rapidly changing environment, the functioning of an organizational system might be more difficult to diagnose than the human system. However, diagnosis, whether applied to organizations or people, will become increasingly effective as it relies more and more on the knowledge of systems, symptoms and standards in the selection and implementation of solutions. An evidence-based approach will result in the expansion and integration of these critical antecedents of a rigorous organizational diagnostic process just as it has in medicine and engineering.

Some early initiatives to improve the rigour in organizational diagnosis are underway. Several academics collaborated to deliver a series of professional development workshops at the Academy of Management under the general title of 'Building Organization Development and Change as an Academic Discipline' (Starr *et al.*, 2006; 2007; Varney *et al.*, 2009), which culminated in a workshop entitled 'Teaching Organizational Diagnosis' (McFillen and O'Neil, 2010). At that session, the presenters described the curriculum for the organization development graduate program at their university, the role of organizational diagnosis in that curriculum, and their methods for teaching organizational diagnosis.

In that programme, the organizational diagnostic process is figuratively and literally at the centre of the curriculum. An evidence-based diagnosis course is preceded by a set of behavioural science courses covering the individual, group and organizational levels of analysis and is followed by a set of courses covering various types and levels of interventions. The diagnosis course covers the inductive process associated with collecting and synthesizing organizational symptoms and the deductive process associated with testing a preliminary diagnosis. A day-long simulation based upon an actual consulting project takes students through the process of organizational diagnosis from first contact with a client through the testing of the preliminary diagnosis. The diagnosis course concludes with what Harrison (2005) refers to as freestanding diagnostic studies in which individual students are required to diagnose situations in organizations of their choosing. The programme finishes with a capstone, team-based field project that requires application of the diagnostic skills learned previously. The positioning of the diagnosis course in the students' programme of study emphasizes the central role of evidence-based diagnosis in the organizational change process. Such efforts to introduce evidence-based diagnosis into academic programmes in OD&C are a beginning, but much more work needs to be done to encourage the field's progression toward this more rigorous approach to organizational diagnosis.



## Conclusion

This article began with an acknowledgement of the failure rate for change initiatives and speculation that misdiagnosis and failure to build readiness for change likely play significant roles in that lack of success. It proceeded to build a case for an evidence-based diagnostic process analogous to that used in the field of medicine and highlighted the significant effort that will be required to move toward adopting such a process in OD&C. Professionals in OD&C should not be discouraged; a great deal of time was required for medical practice to evolve its evidence-based diagnostic process. The evolution of evidence-based diagnosis in medicine has shown the way, and signs of progress in OD&C are already evident. Behavioural scientists have formulated models and theories relevant to organizational change, tested those models and theories, developed standardized measures, and built norms for a variety of important workplace measures. OD&C scholars have developed and catalogued interventions at every level of organizational analysis. Those efforts must continue, and efforts to test interventions in meaningful, evidence-based ways must be expanded. Most importantly, OD&C professionals must begin the process of organizing and sharing what they know to inform and expand the four spheres of knowledge that will move organizational diagnosis toward an evidence-based approach.

To the extent that an evidence-based diagnostic process represents a significant change in current education and practice, Armenakis and Harris (2009) provide guidance to achieving that change: both academics and practitioners in the field must be convinced that current diagnostic practices are not working (discrepancy); that evidence-based diagnosis is the correct path (appropriateness); that evidence-based practice can be achieved (efficacy); that leaders in the field are committed to the change (principal support); and that the change is beneficial to themselves (valence). The authors hope to encourage a change in practice by acknowledging the issues of discrepancy that have emerged in the organizational change literature and by shedding some light on both the appropriateness and efficacy of evidence-based organizational diagnosis.

## Note

1. By contrast, Alderfer (2011), citing Sofer (1972), states that the discipline of organization studies dates only to the start of the twentieth century.

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