

## Diagnostic Classification and Orthopaedic Physical Therapy Practice: What We Can Learn from Medicine

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Concepts of diagnosis and classification have a long history in medicine, while formal schemes of diagnostic classification in physical therapy are relatively new. Basic differences exist between medicine and physical therapy in the phenomena which are diagnosed and classified. However, similarities in the diagnostic and classification process provide an opportunity to learn from medicine as the process now evolves in physical therapy. This paper provides a brief history of the development of the concept of diagnostic classification in medicine and physical therapy. Difficulties associated with the process are described. Knowledge of these difficulties is used to analyze some of the evolving concepts of diagnostic classification in physical therapy, especially those related to orthopaedic physical therapy practice. *J Orthop Sports Phys Ther* 2004;34:105-115.

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The concept of diagnosis and classification of diseases and disorders has existed since the 16th century, when physicians first began categorizing and putting labels on clusters of clinical signs and symptoms.<sup>28</sup> Diagnosis and classification are in common use in today's clinical and research environments and the process is deeply rooted in the philosophy, theory, and evolution of much of health care practice.

Specific use of the concept of diagnosis and classification in physical therapy is more recent. Differences exist between physical therapy and medicine in their use of the concept, but the general process is thought to be both similar and valuable.<sup>16,23,25</sup> Therefore, it seems important that physical therapists should know about the history of the process in medicine and as much about the difficulties that have plagued the process as they do about the value it offers. The purposes of this paper are (1) to briefly orient the reader to the history of diagnosis and classification in medicine and physical therapy, (2) to describe some of the known difficulties associated with medicine's use of the concept, and (3) using knowledge of difficulties in medicine, to analyze some current concepts of diagnostic classification in physical therapy and orthopaedic physical therapy practice in particular.

### DEVELOPMENT OF THE CONCEPTS OF DIAGNOSIS AND CLASSIFICATION IN MEDICINE

#### Nominalism and Essentialism

Early in the history of medicine, the causes of health problems were inferred according to certain belief systems that focused on a disequilibrium within the body. With the advent of the ability to identify microorganisms, a different approach became possible. It became apparent that some groups of signs and symptoms might be accounted for by a specific agent. If a particular microorganism was responsible for only a certain disease, then different diseases caused by different microorganisms would logically be placed in separate categories. A system in which a particular organism could be identified as responsible for a cluster of signs and symptoms was the beginning of etiologic-based diagnosis and classification, and allowed the subsequent development of organism-specific treatment in the form of antibiotic therapies.<sup>28</sup> Furthermore, discovering etiologic factors helped to promote 2 ideas. First, that diagnosis and etiology were almost synonymous, because finding the cause was essential to "clinching" the diagnosis. Second, that given one knew how to affect the cause, mak-

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ing an etiologic diagnosis was the best route towards the most effective treatment.<sup>28</sup>

Conceptually, this approach became known as essentialism. Essentialism is the belief that diseases exist fully formed and that they consist of immutable, distinct groupings that are just “out there waiting to be discovered.”<sup>28</sup> Once a disease is discovered and its etiology known, treatment is logically a matter of eliminating or modifying the etiological agent. As knowledge advanced in medicine, possible etiological mechanisms for disease were expanded over time to include pathoanatomical, pathophysiological, and immunologic abnormalities, as well as infectious sources. The essentialist approach dominated much of early thinking about diagnosis, and the concept is still reflected in part today through the search for specific genes that are thought to control certain illnesses or states of dysfunction.<sup>7</sup>

An essentialist approach to diagnostic classification, however, neglected an entire spectrum of clinical problems in which groupings of signs and symptoms were apparent (and could be effectively treated), even if the causative agent was unknown. The belief that classification could and should still occur, even if the etiology was unknown, was at the root of another method of classification that developed in medicine, called nominalism.<sup>3</sup> A nominalist approach does not require a cause to be known for treatment to occur. Diagnostic criteria to establish and label a disease come from authoritarian sanction of specific clusters of signs and symptoms. Bennett<sup>3</sup> describes the condition known as systemic lupus erythematosus as one example of a nominalist approach to the diagnostic classification of disease. The criteria that are used to establish this diagnosis do not reveal the cause of the disease. They only describe a clustering of the signs and symptoms thought to represent it. These criteria can also be used to guide management, even when the actual cause of the disease remains unknown.

Whether pursued on the basis of an essentialist or nominalistic approach, the basic advantage of, and therefore rationale for, classifying and diagnosing clinical problems in medicine is to impose order on information from clinical and laboratory findings that otherwise would remain chaotic and unconnected. Classification and labeling allow generalizations to be made that can then be used to identify and treat similar problems so that each new patient need not be treated *de novo*. Furthermore, diagnostic classification and labeling provide a structure which allows clinicians to better predict and compare outcomes of interventions for given categories of disease.<sup>17</sup>

## DIFFICULTIES OF DIAGNOSIS AND CLASSIFICATION IN MEDICINE

Despite the apparent and acknowledged advantages of diagnostic classification, the process, in and of

itself, is recognized as a complicated task and it has been a challenge to rigorously apply the process to clinical medicine. Some of the challenges include (1) the relative subjectivity of the classification process itself, (2) the lack of mutually exclusive and jointly exhaustive categories in clinical problems, and (3) the difficulty of deciding at what level of specificity or generality the label called the diagnosis should be set.

### Subjectivity in Classification

To illustrate the subjective nature of classification, Ziporyn<sup>28</sup> described a classroom experiment in which students were given a number of objects of different colors, shapes, sizes, and purposes, and asked to place them into “useful” classifications or groupings. Each student’s organization of the objects was different. Some classified the objects by color, some by size, some by shape, some by purpose of the object.

Whose organization (classification) was “best”? If the user need was to buy a red object, then the color classification was best. However, if the need was to purchase objects that can hold papers together (ie, purpose of object), then a classification system based on color was, at best, inefficient and, at worst, useless. In other words, what constituted the right or best classification depended on how the information would be used. In fact, all classification schemes are inherently imperfect because there is no single criterion that is always appropriate under all situations and that can be used for distinguishing the component categories.

Many examples exist in medicine in which multiple categorizations of the same clinical problem have created confusion. The Quebec Task Force on Spinal Disorders<sup>20</sup> found the literature on low back pain to be replete with different diagnostic terms for low back pain, and 2 or 3 different diagnostic classifications within a single patient’s chart. They reasoned that different individuals simply focused on different aspects of the problem when classifying it. For example, some relied on the main symptom, some on the physiopathological process, and some on the radiological findings. Likewise, Buchbinder et al<sup>5</sup> investigated existing classification systems that are applied to soft tissue disorders of the neck and upper limb and found a wide variety of derivations for the categories that were used. Some labels were based on professional group, some on symptoms or signs, some on radiologic exam, some on physiopathology, and some on the setting in which the problem occurred. In other words, what one group found useful, another found cumbersome or even irrelevant. Because no single method or manner of categorization of the problem was perfect for all purposes, multiple ones developed. The ultimate negative result of this variability in diagnostic classification is that outcome studies seeking to clarify treatment effects on health problems either cannot be done or cannot be effec-

tively compared because of the variability in the labeling or classification of the problems in the first place.<sup>14</sup>

### Mutual Exclusivity in Classification

In ideal classification systems, component categories are mutually exclusive and jointly exhaustive.<sup>17</sup> Many years ago, Feinstein<sup>12</sup> recognized the difficulty that clinical problems pose for maintaining this standard. He noted that classification in biology or chemistry easily lends itself to classifying in a dichotomous way. For example, an object could be categorized as fish or fowl, but not both. Likewise, in chemistry, an element is either sodium or potassium. However, he noted that patients in the clinical world possess different clinical properties simultaneously. He suggested that classification schemes for clinical problems be developed that could purposefully express this inherent overlap. Formal classification systems of disease that acknowledged such overlap did not develop, but diagnoses in some fields suggest overlap does exist and is recognized. In psychiatry, diagnoses such as “anxiety depression” and “schizoaffective disorder” reflect longstanding difficulties in agreeing where to draw boundaries between one syndrome and the next.<sup>17</sup> In orthopaedic classification of shoulder pain, certain characteristics of the clinical problem itself, such as bilateral involvement, severe pain, or chronicity, have been identified as factors that make classification into mutually exclusive and jointly exhaustive categories particularly difficult.<sup>8</sup> These authors concluded that strict maintenance of mutually exclusive and jointly exhaustive categories even lowered the percentage of patients who could be classified at all.

### Generality or Specificity of the Diagnostic Label

A third difficulty involved in the diagnostic classification process is variation in the level of specificity with which a clinical problem is labeled. In medicine, diagnostic labels sometimes represent a specific etiology or, perhaps less specifically, a presenting symptom of the clinical problem. However, other diagnostic labels are distinctly more global or general in nature and there can be controversy over which approach is best. A classic example is the diagnosis of fibromyalgia. In a decade-long debate, some clinicians have supported the relatively specific diagnosis of fibromyalgia and others have favored the more global diagnostic label of functional somatic disorder.<sup>2,21</sup> The disagreement is more than just a semantic argument. Those who argue to broaden the diagnostic label feel that a more specific one may actually be detrimental to the patient. They feel that in the absence of a tissue abnormality or etiology, giving a specific name to this problem may actually prolong

the patient’s disability by reinforcing the patient’s belief that he or she has a serious disease.<sup>2</sup>

## DEVELOPMENT OF THE CONCEPTS OF DIAGNOSIS AND CLASSIFICATION IN PHYSICAL THERAPY

Development of the concept of diagnostic classification in physical therapy is more recent than in medicine. In 1986, Rose<sup>22</sup> first encouraged physical therapists to use the process of diagnosis. Sahrman<sup>25</sup> articulated a rationale for, and proposed one method of doing so. Slightly more than a decade later, the American Physical Therapy Association<sup>1</sup> published a definition for diagnosis and now promotes diagnosis and the diagnostic process as integral parts of its patient care management model. This model and the proposed diagnostic classification process that is part of it are outlined in a document called the *Guide to Physical Therapist Practice (Guide)*.<sup>1</sup> Publication of the Guide focused attention on the diagnostic classification process in physical therapy. However, other classification systems significantly different from the one promoted in the *Guide* also exist.<sup>10,24</sup> The *Guide* and these other systems vary in the ways, and the extent to which, they reflect the process and problems of diagnosis and classification in medicine.

## DIAGNOSTIC CLASSIFICATION SYSTEMS AND ISSUES IN PHYSICAL THERAPY

### Nominalism, Essentialism, and Subjectivity in Classification

Jette<sup>16</sup> has pointed out that a major difference in diagnostic classification between medicine and physical therapy lies in the phenomena that are being classified. He notes that physicians primarily classify the causes of disease, disorders, and injury. In contrast, physical therapists primarily classify the consequences. Consequences are the impairments, functional limitations, or disabilities that result from disease, disorder, or injury. A focus on consequences (versus causes) and the use of a model of disablement (versus a traditional medical model) are the bases for the system of diagnostic classification used in the *Guide*. In this diagnostic classification system, a patient is placed in categories called “preferred practice patterns” (PPPs), according to an identification of the patient’s primary impairments and certain associated conditions. According to the *Guide*, the titles of the PPPs represent the diagnoses that are made by physical therapists.<sup>1</sup> They have been referred to outside of the *Guide* as “impairment-based diagnoses.”<sup>15</sup> A nominalistic type approach to classification is suggested by the facts that, in this system, the focus is not on etiology and the PPPs were established by a process of expert consensus.

In orthopaedic physical therapy, classification systems other than the *Guide* have developed that are more “essentialistic” in nature. In one system,<sup>24</sup> the diagnoses identify “kinesiopathologic” causes of musculoskeletal pain. The idea that aberrant movement patterns can cause musculoskeletal pain or dysfunction—even in the absence of a pathophysiological medical condition—is relatively new. This cause-like diagnostic classification system defines a number of specific and different movement impairment syndromes on the basis of different sets of findings. The diagnosis of a certain movement impairment therefore determines selection of an intervention that is relatively unique to that particular movement impairment syndrome. This process of diagnosis-guided intervention contrasts the system used in the *Guide*, which associates a wide range of interventions with each PPP, but gives little actual guidance in how to select from among the given options.

### Mutual Exclusivity in Classification

From an ideal measurement perspective, categories in a classification system should be mutually exclusive and jointly exhaustive. Many of the musculoskeletal PPPs in the *Guide* consist of listings of similar, not distinctive, impairments. For example, “pattern D”<sup>1</sup> and “pattern G”<sup>1</sup> both include impaired joint mobility, muscle performance, and range of motion. Because of this overlap, the boundaries between the 2 patterns are not necessarily distinct. Furthermore, the interventions described in the *Guide* for these 2 different pattern diagnoses<sup>1</sup> are nearly identical. Medical authors have noted that the potential for a classification problem occurs when the defining characteristics of one pattern are essentially the same as those of another pattern and the treatment for both is also highly similar.<sup>17</sup> The diagnostic classification system that describes movement impairment syndromes seems to avoid this classification problem by defining relatively distinct categories of diagnoses and interventions that are relatively unique to each diagnosis. Likewise, a treatment-based classification system advocated for management of low back pain syndromes<sup>10</sup> not only defines distinct groups of signs and symptoms that suggest particular treatment approaches, but also refines those groups further according to the stage of the disorder.

Interestingly, the *Guide* actually encourages therapists to consider classifying the same patient (if appropriate) into more than 1 preferred practice pattern category.<sup>6</sup> While inconsistent with ideal measurement principles, this practice seems to be overt recognition of the clinical reality—found also in medicine—that patient problems often cross diagnostic boundaries and cannot be easily contained within a single category of a classification system.

### Generality or Specificity of the Diagnostic Label

Developers of the *Guide* have noted that their intention was to make the PPP “broad-based diagnostic umbrella groups.”<sup>6</sup> The PPPs used in the *Guide* place the diagnostic label broadly at the level of impairments. In this system, identifying impairments that are the result of various conditions is considered a key part of the diagnostic process. Focusing on impairment consequences of various conditions has been acknowledged as helpful by clinicians within specific areas of physical therapy practice, such as orthopaedics,<sup>15</sup> neurology,<sup>26</sup> and gerontology.<sup>27</sup> In addition, at least 1 study<sup>9</sup> has documented that physical therapists often do, in reality, manage patients by individual impairments, and another study<sup>13</sup> has reported that patients benefit from treatment that is based on an individual-impairment type of treatment approach.<sup>13</sup>

In the *Guide*, there are PPP diagnoses consisting of impairments that are unassociated with a condition. Practice pattern B, “impaired posture,”<sup>1</sup> and practice pattern C, “impaired muscle performance,”<sup>1</sup> are 2 examples. The lack of association of a condition with these impairments implies that, by themselves, the impairments might be the source of pain and other functional difficulties. However, as Sahrman<sup>18</sup> has pointed out, identifying impairments is different than using information about impairments to establish whether or not a specific condition exists. In fact, some physical therapists have expressed concern that by adopting a diagnostic classification system (such as the PPP), that focuses on broad impairment consequences, more specific pathokinesiological sources of the patient’s problem might be ignored.<sup>11</sup>

In medicine, when a specific cause or source of the problem is known and amenable to treatment, treatment of the cause or source is usually considered more effective than treating its individual signs and symptoms. In physical therapy, identifying specific cause-like diagnoses, such as pathokinesiological movements, may likewise be a more effective basis for intervention than considering and managing individual impairments as isolated phenomena. Though relatively recently introduced into physical therapy practice, there is some preliminary support for the validity of specific movement diagnoses.<sup>4,10,19</sup> What remains unclear is the relationship, if any, that these cause-like types of movement diagnoses and classification systems have to the impairment-based diagnostic classification framework advocated in the *Guide*. If the experience in medicine is a guide, it may be unrealistic to think that there will be one universally agreed on diagnostic classification system that is appropriate to all circumstances in physical therapy practice and is able to meet the needs of all users.

## CONCLUSION

The history of diagnosis and classification in medicine teaches us that the process, while useful and necessary, is complex. Numerous factors such as determining the basis on which to classify clinical phenomena, agreeing on a uniform classification scheme, creating adequate and functionally distinctive categories, and finding the correct level of the problem to be called the diagnosis have all posed significant challenges to the process in medicine. Because these are problems inherent in the process of diagnosis and classification, they are not unique to medicine. They can also be seen to varying degrees in the attempts at diagnostic classification that are currently evolving in physical therapy.

Resolution of these diagnostic classification issues in physical therapy will likely depend on further clinical experience with the model used in the *Guide*, expanded development and validation of the movement diagnostic classification systems, and advancement of the general knowledge base in physical therapy. Experience with the diagnostic classification process in medicine has shown that its advantages are well known and many. The associated complexities may be less often recognized, but they are just as numerous and just as important for physical therapists to know and consider.

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## Invited Commentary

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This review relating to diagnostic classification within orthopaedic physical therapy is timely, as I believe it raises issues that are critical to the future survival and relevance of the profession. No longer can physical therapy (and with it, physiotherapy and manual therapy) be seen as a profession involved simply in symptom palliation, without consideration for the underlying basis and overall management of a disorder in all its complexity.

Take the case of chronic low back pain (LBP), the most expensive health care problem in people 25 to 50 years of age. In spite of the large number of pathological conditions that can give rise to LBP, most cases (85%) are classified as “nonspecific” because a definitive diagnosis cannot be achieved by current radiological methods.<sup>2</sup> Furthermore, the presence of pathoanatomical findings in the lumbar spine often poorly correlate with levels of pain and disability.<sup>9</sup> This situation commonly results in either indiscriminate or generally directed management approaches being administered for patients with these conditions. It has been proposed that this vague term, *nonspecific chronic low back pain*, conceals a multitude of conditions.<sup>7</sup>

It is well recognized that the classification of LBP disorders into homogenous groups and the application of specific interventions tailored for these groups are likely to enhance treatment efficacy.<sup>7</sup> However, a recent review of literature suggests that there is little agreement as to what methodology to apply to this problem.<sup>4</sup> The majority of studies to date that relate to the classification of LBP have focused only on a single dimension of the problem. These consist of pathoanatomical factors (predominantly within the domain of medicine), signs and symptoms, or physical impairments (predominantly within the domain of physical therapy), and psychosocial factors (predominantly within the domain of psychology). Few studies have considered all 3 of these dimensions of LBP within their methodology or classification system.<sup>4</sup>

Clearly there is a need for new criteria to subgroup people within this population, because a focus purely on pathoanatomical factors or signs and symptoms in isolation is not sensitive to identifying the basis of the majority of these pain disorders. A recent focus within physical therapy, in response to this problem (as stated by the author), has been the classification of patients on the basis of movement impairments. This classification system is based on the premise that “movement impairments” are the cause of musculoskeletal pain and dysfunction.

While it is well recognized that movement and motor control impairments exist with LBP disorders,

the mere presence of these impairments does not establish cause and effect. Movement and motor control impairments are known to occur secondary to the mere presence of pain.<sup>12</sup> Pathological processes, such as neurogenic and radicular pain, neuropathic pain, inflammatory disorders, fractures, and tumours all result in altered motor behavior in response to pain. Psychological processes such as stress, fear, anxiety, depression, hysteria, and somatisation are also known to disrupt motor behavior.<sup>5,6,8</sup> Attempts to “normalize” the movement or motor control impairment in many of these disorders would be inappropriate and ineffective.

There is, however, growing evidence that disorders do exist where movement and motor control impairments appear to result in abnormal tissue loading and pain, leaving them amenable to specific physical therapy intervention.<sup>1,10,11</sup> However, to assume that all musculoskeletal pain disorders lie within this classification system ignores clinical reality and the potential impact of pathoanatomical and/or psychosocial factors as contributory or dominating factors within a disorder. In other words, if movement or motor control impairments are present in a disorder, causation cannot automatically be assumed. The therapist must establish whether these impairments themselves contribute to the disorder or are simply a secondary effect of another process.

Historically, physical therapy has focused on symptom palliation. Recently, our profession has taken significant steps to develop an evidence-based approach to practice. However, the scope of any classification system will be limited if it is 1-dimensional in nature, focusing on physical impairments without acknowledging the potential role that pathoanatomical and psychosocial factors play in a disorder. We must not negate the overwhelming evidence of the impact that psychological factors such as fear, anxiety, stress, beliefs, and personality traits, and social factors such as work, family, and financial compensation, to name but a few, have on pain and its expression in the motor system.

It is critical that the classification of musculoskeletal pain disorders be contingent on understanding and identifying the factors underlying a disorder, while understanding the stage of the disorder and the potential contribution of both organic and nonorganic factors that relate to it.<sup>3</sup> For a classification system to be adequately tested, it should fulfill a number of criteria. First, it should clearly define the characteristics of a group. This group should be capable of being clearly defined from other groups. This group should be able to be identified by a number of practitioners skilled in the

classification system. The validity of the classification system then needs to be tested to determine if the characteristics of the group are indeed real phenomena. Perhaps most importantly the classification system needs to be tested in its ability to determine and predict the outcome of the disorder. The gold standard for this is to test the classification system by way of randomized controlled research.

The author rightly states that it is unlikely that there will be one universally agreed upon diagnostic classification. However, the physical therapy profession faces an enormous challenge: the identification of clinical diagnostic subgroups within the “nonspecific” chronic LBP population, based on a multidimensional framework, while considering the stage of the disorder and developing treatment interventions that are effective in their management.

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## Invited Commentary

I enjoyed reading Nancy Zimny’s clinical commentary on the development of the concepts of diagnosis and classification in medicine and the subsequent difficulties of universally applying diagnostic classifications. As medicine has had to grapple with attempting to apply diagnostic classifications to clinical practice, so too will physical therapists continue to grapple with these same difficulties as they apply increasing diagnostic classifications within their clinical practices. The same complications resulting from subjectivity, lack of mutual exclusivity, exhaustive categories, and of determining level of specificity or generality, plague physical therapists in their attempts to define and refine diagnostic classification schemes used for the patients and clients for whom they provide services.

In the way of a little historical background as it relates to standardizing diagnoses for physical therapists in the *Guide to Physical Therapist Practice (Guide)*,<sup>1</sup> it is important to look at the process that took place. All diagnostic classifications available at that time were reviewed in depth. These included the typical medical diagnostic codes (ICD-9), the impairment models, and the movement dysfunction approaches. The ICD-9 codes were ruled out early on for all of the very apparent reasons. Two classic examples of why this system was inappropriate for our purposes are described below. The first example involves 2 patients with multiple sclerosis: the first patient is a 78-year-old female who requires the use of a posterior splint to control the genu recurvatum of her left knee, but is otherwise totally independently function-

ing in all of her activities of daily living. The second patient is a postpartum 29-year-old female who is wheelchair dependent and unable to perform her activities of daily living independently. The diagnosis of multiple sclerosis in these 2 patients would not direct my physical therapy interventions; in the same way, for example, the secretary who has a foot drop may still be independent and gainfully employed, versus the New York City police officer with a foot drop who may not perform the requirements of the job on the streets of New York. These and many other examples led us to look at alternative models.

Nagi was the first individual to look at the inappropriateness of the typical medical classification of disease (ICD-9 codes) for patients needing rehabilitation, and his model for classification of impairments was put forth in 1965.<sup>5</sup> His model included the terms pathology, impairment, functional limitation, and disability. We looked at the following: the World Health Organization International Classification of Impairments, Disabilities, and Handicaps model of disease, impairment, disability, and handicap, which evolved in 1980<sup>10</sup> and was replaced in 1998 with the model of disease, impairment, activity, and participation<sup>9</sup>; the National Center for Medical Rehabilitation Research (NMCRR) classification of pathophysiology, impairment, functional limitation, disability, and societal limitation<sup>6</sup>; the Institute of Medicine (IOM) classification of nondisabling condition, pathology/pathophysiology, impairment, and functional limitation, with the added factors of biology, environment, lifestyle and behavior, and quality of life;<sup>3</sup> and an expanded model of disablement that included pathology/pathophysiology, impairment, functional limitation, and disability, with the added factors of biological and environmental factors, comorbidity, health habits, personal behaviors, lifestyles, psychological attributes, physical and social environment, medical care, medications/therapies, rehabilitation, and mode of onset and duration.<sup>2</sup>

We then looked at the work done in the movement dysfunction arena to see if any particular schema would fit all the needs of the *Guide*. We looked at the work of Sahrman, McKenzie, and Barnes, among others. Interestingly, Sahrman observed in 1988<sup>7</sup> that work was being done on the development of a classification project that would enable physical therapists to assess muscle tone in patients with hemiplegia.<sup>8</sup> In an attempt to see if standardization of that classification was fully developed and widely used, no follow-up research could be found. McKenzie's system, while used by some physical therapists, had a focus that was too narrow for the scope of the *Guide*. Thus we agreed by consensus that the model used would be impairment based and that the diagnoses would follow that schema. However, the other factors noted by NCMRR, IOM, Jette,<sup>4</sup> and Guccione,<sup>2</sup> that influenced the impairment model

and thus the diagnosis, were included in the history, evaluation, factors requiring a new episode, and factors that may have modified frequency or duration. We also agreed that it was better to use systems that had been in use, rather than to jump on cause-based diagnoses that have not, as yet, stood the test of time.

It is important to understand that the *Guide* purposely used broad diagnostic categories with the explicit understanding that it was a work in progress. As the *Guide*, from its first iteration, went through several revisions, so too will the entire diagnostic area be refined as time goes on. One also has to consider the fact that movement-based classifications are not incompatible with the practice parameters of the *Guide*. If movement is a system, then movement dysfunction is an impairment. Furthermore, even the treatment-based approach, using signs and symptoms as diagnoses, chooses interventions based on those signs and symptoms, which may also be considered impairments. Thus, regardless of how the diagnosis is reached, it must be understood in the context of the patient's current function and desired functional level.

The *Guide* classification of diagnoses through the practice patterns only points in the direction of what the intervention should be. In almost every practice pattern, with the exception of the prevention patterns, and the impaired-posture and impaired-muscle-performance patterns, the impairments are linked to a pathological or pathophysiological condition. However, even these 2 patterns, impaired posture and impaired muscle performance, are linked with multiple ICD-9 diagnostic codes. As in medicine, the exact interventions will be selected based on several factors, including the specifics of the examination, the diagnosis, the available research, and the best practice.

One must also remember that the patient-client management model (examination, evaluation, diagnosis, prognosis, intervention) is as important to understanding the practice parameters as the practice parameters are themselves. The first 4 steps in the management model define the specific treatment from the broader listing of likely interventions for each parameter.

As an aside, I looked at state physical therapy practice acts to see where we currently stand on the use of the word "diagnosis" in our acts. One of the earliest acts was that of New York State, which was done while I was president of the New York chapter. In the writing of the act in 1978, we included the words "to aid in diagnosis and prognosis," and that act was passed in 1980—almost a quarter of a century ago. To date, 14 states (AZ, AR, GA, ID, KS, LA, NH, NJ, NM, NY, OH, SD, TN, and WI) include the word *diagnosis* in their state definition of physical therapy practice.

As we finally put in writing what physical therapists have been doing for many years (that is, making diagnoses), there should be increasing recognition of the skill of the physical therapist in this arena. There are still those among us in the profession who will remember when it was taboo to say that we render a diagnosis. Yet with physician diagnoses of “pain of a body part” or inappropriate diagnoses for many years, we did indeed make diagnoses that then directed our interventions. We finally have emerged from beneath the taboo to a profession that has rightfully assumed the appropriateness of our skills in the diagnostic process.

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## Invited Commentary

I believe that there is always room for dialogue about diagnosis and I welcome papers such as Nancy Zimny's into the peer-reviewed literature, if for no other reason than to maintain a focus on this most important topic. Nancy Zimny presents a very nice historical perspective of diagnosis in medicine and goes on to present the advances, as well as the difficulties, that medicine has had over the years in developing diagnostic models of diseases. Parallels are made with physical therapy, which she correctly states is in a much earlier stage of development, and she once more points out some of the problems that arise when we develop categories without the benefit of data-driven studies. My comments are related to a few major points brought out by this perspective; I will elaborate on these with the goal of motivating physical therapists to perform more data-based work in the area of diagnosis in physical therapy.

Nancy Zimny's contribution joins those of numerous authors in the physical therapy literature who have so eloquently stated the importance of diagnosis in physical therapy. Some of these authors have offered road maps of where diagnosis by a physical therapist fits in well established models of disablement. Zimny has added to this literature by making

parallels to medicine and defining concepts such as nominalism and essentialism. But sooner or later, our field has to do more than talk about diagnosis. Granted, some have certainly answered the call for further relevant work in the area of diagnosis. However, I would state that the overall amount of data-driven work in diagnostic studies is lagging, particularly in a period of time when we are under enormous pressure for increased randomized controlled trials (RCTs) to document the effectiveness of the interventions that are used everyday by physical therapists. Many have cautioned about the shortcomings of conducting RCTs without fully studying diagnosis, subclassifications, categories, etc, of patient groups, and we only need to look at literature related to low back pain to fully appreciate this point.

Unlike studies of treatment effectiveness, such as the RCT, my experience has shown me that the study designs and statistical concepts used to study the diagnostic process are some of the more poorly understood methodologies. In addition, the whole area of diagnosis is almost always forgotten when the topic of evidence-based practice is broached. These are 2 shortcomings that may well explain the lack of data-driven investigation in this area. Perhaps putting

the diagnostic process in the context of everyday clinical practice may help. Consider that we all witness physical therapists spending countless hours examining patients before any sort of treatment decisions are arrived at; one must assume that something related to a diagnostic process is being undertaken in this time. This process presumably leads to increased efficiency, better treatment decisions, and more favorable patient outcome. We commonly lament the amount of time novice clinicians spend examining patients without any semblance of prioritization to their examination techniques. At some point, experience appears to reduce the amount of time spent on exam. We would like to assume that seasoned clinicians spend less time, because they learn through experience the diagnostic value of tests and eliminate those tests, which are of less value. Of course we would like to avoid other explanations that relate to a more random explanation for this apparent increased efficiency. We will never know which explanation applies until we actually put diagnostic tests to the test.

A recent search of the literature, using the keywords *diagnosis* and *physical therapy*, revealed 180 hits, which on the surface may appear positive. A closer look at this list reveals precious few studies that actually investigate the diagnostic process as performed in relevant settings. Few investigations are available that study the diagnostic value of clinical tests commonly used by physical therapists that presumably guide treatment decisions. It's time to take stock in the diagnostic value of the tests and measures that we use in everyday clinical practice and publish the results of these findings.

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## Author's Response

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These 3 commentaries reinforce and extend the discussion of the complexities involved in developing diagnostic classification systems, no matter who the "user" is. Clearly there is agreement on issues related to the need and value of such systems in physical therapy. However, just as obvious are the distinct challenges surrounding the specific kind of system or systems that will best meet the needs of physical therapy users and how those systems should be developed.

O'Sullivan, using the specific example of chronic low back pain, suggests that from a professional-survival and evidence perspective, an effective system must be multidimensional. It should somehow categorize pathoanatomical and psychosocial factors, in addition to including distinctive subgroupings of individuals' impairments and staging of the disorder. Once developed with these basic components, the system should be assessed on its ability to meet certain measurement criteria and the gold standard of randomized controlled trials for ascertaining its ability to determine and predict outcomes.

Moffat, in describing the work of the group that developed the existing diagnostic classification system included in the *Guide*, reiterates the point that physical therapists—having different user needs than physicians—needed a different kind of system than the traditional medical model. The solution of this group was to review a number of pre-existing classifi-

cation schemes related to disablement models and movement dysfunction. Using a consensus model, this group developed a new classification system based on impairments that can be extended or qualified by other pieces of information gathered in the examination, evaluation, diagnosis, and prognosis parts of the patient-client management model.

Delitto strongly suggests that the power of evidence-based practice be brought as equally to the issue of determining the best classification systems, as it has been for determining the best treatments. He notes that doing so will require better familiarity (than currently exists in physical therapy) with the design and statistical methodologies involved in developing and assessing the diagnostic process. Importantly, he notes the irony of having focused so heavily on investigations of treatment effectiveness without first having determined the validity of the very diagnostic classifications on which these investigations rely.

Many, if not most, of the issues and challenges (and even some of the solutions) the commentators describe have analogous counterparts in medicine. As medicine has found, progress will likely come from both further qualitative assessment and quantitative investigations<sup>1</sup>; but even then, we should expect no easy or singular solution. The diagnostic classification process used and described in physical therapy, to date, includes multiple elements—some etiological,

some nominalistic, as well as relatively unique aspects of needing to simultaneously classify the physical, social, and psychological environment in which the diagnosis expresses itself. All these pieces, collectively seem to be driving forces that help determine appropriate physical therapy intervention. For this reason, as others have already suggested,<sup>2,3</sup> we might want to consider separating the concepts of diagnoses and classification in our minds, instead of commonly referring to the package of “diagnostic classification.” Diagnosis is one way to classify, but all classification is not by diagnosis. We seem to be doing both.

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