Brazilian Journal of Physical Therapy 27 (2023) 100560

abrapg·ft
Associação Brasileira de Pesquisa e Pós-Graduação em Fisioterapia

Brazilian Journal of Physical Therapy

https://www.journals.elsevier.com/brazilian-journal-of-physical-therapy

MASTERCLASS

A proposal for a universal physical therapy diagnostic concept

Marc Perron[a,*], Rachel Brosseau[b,c], Désirée B. Maltais[a,d], Vincent Piette[a,e], Alain Godbout[f], Hélène Corriveau[g,h], Luc J. Hébert[a,d,i]

[a] *École des sciences de la réadaptation, Université Laval, Quebec City, Canada*
[b] *École de réadaptation, Université de Montréal, Montreal, Canada*
[c] *Institut de Cardiologie de Montréal, Montreal, Canada*
[d] *Centre interdisciplinaire de recherche en réadaptation et intégration sociale (CIRRIS), Quebec City, Canada*
[e] *Centre Hospitalier Universitaire de Québec, CHUL, Quebec City, Canada*
[f] *Institut de réadaptation Gingras-Lindsay de Montréal, Montreal, Canada*
[g] *École de réadaptation, Université de Sherbrooke, Sherbrooke, Canada*
[h] *Centre de recherche sur le vieillissement du Centre intégré universitaire de santé et services sociaux de l'Estrie — Centre hospitalier universitaire de Sherbrooke (CIUSSS de l'Estrie — CHUS), Sherbrooke, Canada*
[i] *Département de radiologie et de médecine nucléaire, Université Laval, Quebec City, Canada*

Received 5 October 2022; received in revised form 25 March 2023; accepted 25 October 2023
Available online 7 November 2023

KEYWORDS
Classification;
Clinical practice;
Diagnosis;
Physical therapy;
Physiotherapy

Abstract
Background: In Canada, as in other countries, the physical therapist (PT) must make a diagnosis to comply with direct access responsibilities. This means making a diagnosis is an entry-to-practice essential competency. However, there is no consensus across physical therapy practice domains and contexts regarding the diagnostic concept, i.e., the classification system, labelling and diagnostic format that should be used.
Objective: To propose a universal diagnostic concept, one a PT could use regardless of their practice domain or context.
Methods: The relevant scientific and grey literature (1986—2022) were searched and key information was synthesized.
Results: Information from 194 retained documents (8506 identified) was synthesized to a list of seven essential criteria that were then used to develop a universal physical therapy diagnostic concept (PT-Dx-C). The PT-Dx-C format consists of three labels in the following order: (1) health problem, (2) primary impairment, and (3) primary activity limitation or participation restriction. Label definitions are those used by the World Health Organization. The specific health problem, impairment, and limitation or restriction making up the diagnosis are determined for each patient using valid tests and measures.

* Corresponding author at: School of rehabilitation sciences, Faculty of Medicine, Université Laval, Pavillon Ferdinand-Vandry, room 4218, 1050 avenue de la médecine, Quebec city, QC G1V 0A6, Canada.
E-mail: marc.perron@fmed.ulaval.ca (M. Perron).

https://doi.org/10.1016/j.bjpt.2023.100560

Conclusions: The PT-Dx-C is consistent with best practices and could be applied to all patients, in all PT practice domains and contexts. It reflects the PT's expertise in the human movement system and their unique contribution to health care. Furthermore, its use may allow for communication of the PT's conclusions in a manner that can be understood by others thereby facilitating collaborative practice.

Introduction

The advent of direct access to physical therapy services in many countries[1–4] has largely contributed to the recognition of the physical therapist (PT) as a front-line health-care provider, meaning the PT must make a conclusion about the patient's condition based on findings from their assessment before establishing and carrying out an intervention plan. In Canada, for example, this has lead to making a diagnosis as being one of the essential entry-level PT competencies.[5,6]

However, there is no consensus across all PT practice domains and contexts regarding the diagnostic concept, i.e., the process, classification system with labels and diagnostic format that should be used. In fact, there has been long standing debate in this area.[7–10] The Diagnostic Dialog initiative, which brought together expert clinicians, researchers and educators from the American Physical Therapy Association (APTA) between 2006 and 2016[7] did advance the discussion somewhat. In the end, the consensus of the expert group was that a pathoanatomical diagnosis is insufficient to guide physical therapy interventions and that PTs should use diagnostic classifications with terms (labels) that reflect their expertise in the movement system.[7,11,12] The APTA then created a Movement System Task Force and held a Movement System Summit.[7] From that summit arose criteria for naming movement-related conditions that formed the basis of the APTA recommendations for any PT group who wished to develop a diagnostic concept.[13]

Because these recommendations do not necessarily lead to standardisation of the diagnostic concept that can be applied to all patients in all PT practice domains and contexts, what a PT communicates as their diagnosis remains the clinician's choice. This lack of standardization can lead to a lack of diagnostic clarity and subsequent confusion for the other health care professionals, patients, families, and other stakeholders who are relying on the PT's diagnosis for the patient follow-up and clinical management. In addition, the lack of standardization can make it difficult to evaluate the diagnostic competency of a PT student or candidate applying for licensure to practice. To address these issues, the physical therapy licensing body in Quebec, the *Ordre professionnel de la physiothérapie du Québec* (OPPQ), tasked Professor Luc J Hébert, to chair a committee whose objective was to propose a standardized physical therapy diagnostic concept (PT-Dx-C) that would consider the APTA criteria, respect the legislation under which Quebec PTs practice and be universally applicable to all patients, across all PT practice domains and contexts. This paper describes the PT-Dx-C developed by the committee.

Method

The committee members were nine licenced PTs with clinical, academic and research experience in various area of physical therapy practice.

A scoping type review of the white and grey literature (1986–2022) identified existing diagnostic concepts, including classification systems, used within and outside the physical therapy profession. Details on the review strategies are presented in the supplementary material.

Because a significant number of published papers regarding the diagnosis made by PTs that we retrieved were in the form of an invited commentary, conceptual paper or expert group consensus, it was not possible to use a known rating system that would allow one to meaningfully distinguish the quality of the information in one document from another. Therefore, from a first reading, the committee systematically categorized the retrieved documents, into four categories according to the criteria described below using a consensus approach:

Category 1 *– highly contributive to the development of the PT-Dx-C and relevant to all conditions or populations seen by a PT.* The documents assigned to this category were those that specifically discussed diagnosis in the context of physical therapy practice with applicability to all conditions or populations seen by a PT. In addition, they were deemed highly contributive to the development of the Pt-Dx-C by all the committee members (9/9) i.e. the documents had to contain original concepts or ideas that were supported by scientific data or strong arguments. These documents were systematically read and analysed by all committee members (9/9).

Category 2 *– moderately contributive to the development of the PT-Dx-C and relevant to all conditions or populations seen by a PT.* The criteria for assignment in this category were the same as for category 1 with one exception. Documents assigned to category 2 were those that were not considered highly contributive to the development of the PT-Dx-C by all committee members (<9/9). These documents were systematically read and analysed by two members of the committee.

Category 3 *– highly contributive to the development of the PT-Dx-C but only relevant to a specific condition or subpopulation seen by a PT.* The documents assigned to this category were those that specifically discussed a diagnosis in the context of physical therapy practice, but their content was relevant to only a sub-set of conditions or populations seen by a PT. Assignment in this category was decided by a consensus of the committee members. These documents were systematically read and analysed by two committee content experts.

Category 4 *– supplemental documents*: The documents assigned to this category were those whose content either did not target any specific condition or population seen by a PT, or whose content was very general with respect to diagnostic classifications. For example, documents in this category might discuss diagnostic concepts not specific to the field of physical therapy. These documents were read and analysed by at least two members of the committee.

Retrieved documents were rejected if they did not meet any of the criteria listed above, that is: they did not contain new ideas or concepts, were not well supported by scientific data or strong arguments, simply replicated or synthetized the content of original papers, did not specifically discuss diagnosis in health professions or were abstracts only.

To facilitate further analyses, each committee member extracted the relevant citations of their respective readings in a standard table and organized them according to specific pre-determined objectives detailed in the supplementary material. Results were summarized during face-to-face meetings with the aim of reaching a common understanding, synthetizing the information, and responding to the objectives of the committee.

Results

The committee held 17 meetings over 40 months. The final report was submitted to the OPPQ in December 2009.[14] From 8506 documents found in the two searches, 194 were read in full and categorized by the committee members (category 1, *n* = 45; category 2, *n* = 51; category 3, *n* = 36; category 4, *n* = 62).

The retained documents typically described classification systems, labels or formats applicable to a subgroup of patients seen by PTs, commonly from the neurological[11,15–18] or musculoskeletal[19–23] practice domains. Other previously published diagnostic concepts attempted to be universally applicable but had marked limitations. The APTA proposed a classification system of "Preferred Practice Patterns"[24] while Gedda[25] proposed a classification and labelling system based on impairments of structures and function. However, these concepts have not been adopted because they were complex to assimilate and did not correspond to the way PT manage and treat their patients.

In the majority of documents we reviewed, diagnoses were based on results from standardized assessment of specific movements/tasks[15,17,18,20,21,23] and in some cases, from the examination of associated impairments.[15,17,23] Diagnostic classification and labels often referred to the movement or associated impairments[15,17,21,23] and sometimes to interventions.[20,26] The pathoanatomical component, however, was rarely included.[22]

After reviewing and synthesizing the content of the retained documents, the committee concluded that they could not identify a published diagnostic concept that was applicable to all patients in all physical therapy practice domains and contexts. The committee therefore decided to use the information from the documents to develop the criteria of a new universal PT-Dx-C, which are formulated as follows:

1. The PT-Dx-C *is a process with a classification and labelling structure that uses a specific format:* making a diagnosis involves rigorous data collection (structured interview and physical examination), analysis and synthesis that culminates with specific diagnostic labelling in a consistent format.[10,24,27–29] The labelling must be in keeping with the commonly accepted meaning of the term diagnosis that is, a statement or conclusion from the assessment[30] that identifies the presumed causes or consequences associated with the health problem. Whenever possible, the diagnostic labelling should include the identified health problem and its severity[10,29,31,32];
2. The terms of the PT-Dx-C *must be understandable by the healthcare team to facilitate collaborative practice:* the diagnostic classification and labelling must use recognizable and operationally defined terms that are mutually exclusive and do not overlap[9,10,17,18,29,33,34];
3. The PT-Dx-C must be flexible enough to evolve according to the advancement of science, the physical therapy profession and society[10,34,35];
4. The PT-Dx-C must be applicable to all patients in all physical therapy practice domains and contexts[24,36,37];
5. The PT-Dx-C *must be consistent with evidence-based and best practice*[9,10,34,38]; notably, the patient data that are analysed and synthesized to establish the diagnosis must be collected using tests and measures with appropriate measurement properties;
6. The PT-Dx-C must include the information needed to determine precautions or contraindications, establish the prognosis, and guide the selection of physical therapy interventions[9,17,18,24,25,27,34,35,39–42];
7. The PT-Dx-C must reflect the whole person at the organic, individual and social level as well as contextual factors and the interaction between these different elements.[43] Taking this information into account could substantially modify the diagnostic labelling and therefore, the choice of interventions and establishment of the prognosis.[27–29,34,41,44]

Operational definition of the diagnosis made by the PT

The diagnosis made by the PT stems from a rigorous process in which the PT organizes, analyses, and synthesizes patient data and then establishes a diagnosis using a standardized classification and labelling format. The diagnosis made by the PT must therefore indicate the patient's health problem and its impacts on functioning as relevant to physical therapy practice in the context of the individual and their contextual factors.

As to the format of the diagnosis made by the PT, the committee proposed the following three distinct components for the PT-Dx-C in the following order:

HEALTH PROBLEM
(severity, classification, type or stage of the condition)
characterized by the **PRIMARY IMPAIRMENT(S)**
Limiting or restricting the
PRIMARY ACTIVITY LIMITATION(S) AND/OR **PARTICIPATION RESTRICTION(S)**

The health problem is the condition, or illness of the patient labelled using the latest version of the International Classification of Diseases (ICD-11).[45] To further describe the health problem, the PT-Dx-C can also include one or more classifications, such as severity (e.g., ligament sprain grade), type (e.g., fracture classification) or stage (ex. stage of osteoporosis). In some contexts, such as in the early stage of a health condition, specificity may not be possible. In this case, it is recommended that the PT categorize using more general terms and proceed accordingly.[46]A more specific diagnosis may be established later, depending on the course of the condition, which reflects the fact that the diagnosis is really an evolving working hypothesis. The PT can identify certain health problems included in the ICD if the tests required to confirm the health problem are within their scope of practice as defined by the legislation under which they practice. When the tests required to identify and describe the health problem are not within the PT scope of practice, the physician's contribution to the identification of the health problem should be acknowledged in the labelling.

The primary impairment is labelled according to the International Classification of Functioning, Disability and Health (ICF).[43] This is a problem with an anatomical structure or an organic function that, according to the PT's clinical reasoning, is the main contributor to the patient's primary activity limitations and participation restrictions. For more specificity, the PT may indicate the level of a given impairment by using the results of a test for which the measurement properties (e.g., metrological qualities) are known and appropriate for this function. The primary impairment should ideally be a treatment-effect mediator,[47] which is known to improve in response to an intervention and to correlate with a change in the patient's limitation.

The primary activity limitation or participation restriction, also labelled according to the ICF,[43] are, respectively, the main difficulty or difficulties in performing a task or in being involved in a real-life situation that best account for the patient's disability. For more specificity, the PT may indicate the level of a given limitation or restriction by using the results of appropriate tests. It is the PT's decision as to whether to include one or more activity limitations or participation restrictions. This is patient-centred by taking into consideration the patient's values, needs, contextual factors and the relevant results from the PT's assessment.

The committee chose to use the ICD[45] and the ICF[43] for diagnostic classification and labelling as they use mutually exclusive and jointly exhaustive classification components and labelling which are fundamental properties of a diagnostic classification.[34] They are also complementary, and together, sufficient to describe the patient condition and guide physical therapy interventions. The ICD and ICF are also meant to be shared by all health professions to facilitate collaborative practice. Thus, the PT is advised to use ICF terms that correspond to their own scope of practice, as defined in the legislation under which they practice.

Discussion

The present paper describes the PT-Dx-C, a diagnostic concept that could apply to all patients in all physical therapy practice domains and contexts, as well as the process used to develop it. The choice of a standardized format for the PT-Dx-C as well as ICD and ICF classifications and labelling help to ensure that application of the PT-Dx-C will facilitate communication amongst healthcare professions and other key stakeholders. The process employed to develop the PT-Dx-C as well as the criteria that the PT must use to establish their diagnosis is likely to produce a label that is clinically meaningful and that reflects most accurately the patient's health condition and functioning and therefore, that can guide the PT in the establishment of a prognosis and intervention plan.

The PT-Dx-C is in keeping with APTA recommendations on a diagnosis that emerged after years of discussions.[13] The PT-Dx-C uses recognized, movement-related terms (and similar terms for similar movements) and it can be applied to all patients regardless of their health condition, age or context. Moreover, the PT-Dx-C advances the work of Jiandani and Mhatre[48] who suggested using the ICD and the ICF for different but complementary diagnostic purposes. They emphasized the importance of knowing the pathoanatomical source of symptoms, as they believed this is necessary to guide the PT to hypothesize the expected impairments and plan the assessment with due precautions or contraindications for diagnosing movement dysfunctions. Finally, they also recommended using the ICF to allow for a clear description of the functional status of the patient in terms of impairments of body structures and function, activity limitations and participation restrictions.[30] The PT-Dx-C, however, goes further than the proposition of Jiandani and Mhatre by imposing seven criteria and a standardized format to the diagnostic classifications and labelling, thus helping to ensure that the relevant components of the diagnosis are always in place.

The use of the ICF and ICD labels achieves the primary function of diagnosis, which is to communicate to others the conclusions of the PT's assessment. The use of the ICF provides a universal language and terminology for communication and classification purposes across the health care professions.[49] In a few papers published recently,[49–51] some have raised concerns about numerous repercussions of creating and using profession-specific diagnostic labels. PT-Dx-C addresses this concern by including the commonly employed interdisciplinary diagnostic labels from the ICD and simply adding movement expertise from the PT's assessment to communicate more information to others as well as to guide the intervention process.

Similar to the PT-Dx-C, previously published diagnostic concepts include the assessment of standardized tasks and underlying impairments. Some movement system-based diagnostic concepts, for example, describe a process in which the diagnosis is established from the observation of

specific clusters of movement impairments during the execution of core tasks.[11,15,16] Task observation may then generate hypotheses on underlying impairments that once confirmed may guide the intervention plan. The PT-Dx-C also involves a rigorous examination process that includes a systematic observation of tasks. However, in line with the seventh criterion of the PT-Dx-C, the tasks observed are determined primarily according to the patient's specific needs. Additionally, the PT-Dx-C labelling identifies the primary impairment as the major contributor to the patient's primary limitations or restrictions. Thus the PT-Dx-C format and logic can help to facilitate the identification of treatment priorities,[52] whether they be aimed at impairments, limitations, restrictions or a combination of these factors.

Movement system-based diagnostic concepts focus on the movement pattern impairments without explicitly noting relationships between the impairments and the patients' limitations or restrictions.[11,15,16,21,23] This is an important shortcoming because not all movement pattern impairments result in important limitations or restrictions and therefore not all movement pattern impairments warrant intervention. One example is the recent evidence-based recommendations for children with cerebral palsy practicing walking on a treadmill to improve walking capacity.[53] By focusing on the whole task of walking, movement pattern impairment due to a loss of integrity of certain body function(s) and compensations are acceptable and the walking intervention is manipulated by the PT to ensure that compensations do no harm.

Our concept leaves room for the PT's judgement in establishing their diagnosis, that is, in prioritizing which impairments, activity limitations and participation restrictions are most relevant to the patient's situation at a given point in time. Thus, the PT-Dx-C supports the PT using their expertise in a more holistic manner. With the PT-Dx-C, the PT is not simply an expert in the movement system[12,13] but they are an expert in establishing the relationships amongst movement-related impairments, activity limitations and participation restrictions.

The PT-Dx-C is a universal physical therapy diagnostic concept and thus addresses limitations of condition-based (e.g., balance problem, back pain) or practice domain-based (e.g. neurological, musculoskeletal) concepts which can have several terms that describe the same condition depending on the concept used by the PT. For example, for the same health condition, in this case a low back problem, the PT could establish their diagnosis as derangement syndrome using the McKenzie method of Mechanical Diagnosis and Therapy (MDT),[20] as symptom modulation approach using the treatment-based classification (TBC)[26] or as lumbar flexion syndrome using Movement System Impairment (MSI) syndromes classification.[21] This disparity in conceptual models and in the terminology used in each classification makes it difficult to interpret the conclusion of the evaluation made by PTs for people not familiar with the specific concept the PT used.

The PT-Dx-C is a proposed framework that would benefit from further study. One limitation of the PT-Dx-C is that its reliability has not yet been quantitatively evaluated. Furthermore, we do not know if the diagnostic label as established by the PT brings sufficient and relevant information to describe what it purports to describe, that is the patient functioning, which refers to the validity of the PT-Dx-C. Thirdly, further information is needed on how it is used in practice, including barriers and facilitators to its implementation and the extent to which use of the PT-Dx-C facilitates communication and optimal outcomes, be they client- or service-based. The diagnosis that emerges from the PT-Dx-C could also be considered long because it includes the ICD terms to name the pathology or condition. As front-line health-care providers, PTs need to name the patient's health condition because this information dictates precautions and contraindications and facilitates establishing the prognosis and the intervention plan. Movement system-based diagnostic concepts, however, do not necessarily include this information. Alternatively, the diagnostic label can be left as is, without including the health problem component, if this information is known from the PT and accessible in the medical record. The PT-Dx-C is thus a concept that promotes both collaboration between healthcare professionals and the added value that the PT brings to healthcare service provision with their unique expertise and skill beyond identification of the health condition. The supplementary material shows some examples of diagnostic labelling according to the proposed PT-Dx-C.

Conclusion

To provide appropriate physical therapy services, the PT must make a diagnosis. This step is an essential competency for entry into practice, especially given the existence of direct access to physical therapy. The PT-Dx-C is applicable to all patients in all physical therapy practice domains and contexts. While it has a standardized format, it is a pragmatic, flexible, holistic, and collaborative concept that promotes and supports clinical reasoning and judgement. The diagnostic labelling of the PT-Dx-C clearly reflects the PT's expertise in the human movement system and allows for clear communication of the PT's conclusions in a way that can be understood by others.

Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgments

We would like to thank all colleagues who provided feedback on the PT-Dx-C proposed in this manuscript. We would also like to thank Louise Bleau, Louise Banville, Denis Martel and Serge Orzes for their organizational support and professional advice. A special acknowledgement should also be made to one of the authors, Luc J. Hébert, chair of the OPPQ committee, for his dedication and leadership in the project. Funding sources: This work was supported by the Ordre professionnel de la physiothérapie du Québec.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.bjpt.2023.100560.

References

1. Bury TJ, Stokes EK. Direct access and patient/client self-referral to physiotherapy: a review of contemporary practice within the European Union. *Physiotherapy*. 2013;99(4):285—291. https://doi.org/10.1016/j.physio.2012.12.011.
2. Bury TJ, Stokes EK. A global view of direct access and patient self-referral to physical therapy: implications for the profession. *Phys Ther*. 2013;93(4):449—459. https://doi.org/10.2522/ptj.20120060.
3. Canadian physiotherapy association. *Canadian Physiotherapy Association*. World Physiotherapy; 2021. Accessed June 25; https://world.physio/membership/canada.
4. Ordre professionnel de la physiothérapie du Québec. Physiothérapie : comment ça fonctionne ? OPPQ. Accessed June 25, 2021. https://oppq.qc.ca/la-physiotherapie/comment-ca-fonctionne/.
5. Canadian council of physiotherapy university programs. National physiotherapy entry-to-practice curriculum guidelines. Accessed June 25, 2021. https://www.physiotherapyeducation.ca/resources.php.
6. National physiotherapy advisory group. Essential competency profile for physiotherapists in Canada (2017). Accessed June 25, 2021. https://physiotherapy.ca/essential-competency-profile.
7. Norton BJ. Diagnosis dialog: recap and relevance to recent APTA actions. *Int J Sports Phys Ther*. 2017;12(6):870—883.
8. Rose SJ. Description and classification—the cornerstones of pathokinesiological research. *Phys Ther*. 1986;66(3):379—381. https://doi.org/10.1093/ptj/66.3.379.
9. Rose SJ. Physical therapy diagnosis: role and function. *Phys Ther*. 1989;69(7):535—537. https://doi.org/10.1093/ptj/69.7.535.
10. Sahrmann SA. Diagnosis by the physical therapist—a prerequisite for treatment. A special communication. *Phys Ther*. 1988;68(11):1703—1706. https://doi.org/10.1093/ptj/68.11.1703.
11. Hedman LD, Quinn L, Gill-Body K, et al. White paper: movement system diagnoses in neurologic physical therapy. *J Neurol Phys Ther*. 2018;42(2):110—117. https://doi.org/10.1097/NPT.0000000000000215.
12. Sahrmann S. Defining our diagnostic labels will help define our movement expertise and guide our next 100 years. *Phys Ther*. 2021;101(1):pzaa196. https://doi.org/10.1093/ptj/pzaa196.
13. American Physical Therapy Association. Movement system diagnosis template. APTA. Accessed June 25, 2021. https://www.apta.org/apta-and-you/online-forms/movement-system-diagnosis-template.
14. Hébert LJ, Banville L, Bleau L, et al. Proposition d'une définition conceptuelle du diagnostic .mis par le physiothérapeute. *Dropbox*. 2021. Published 2009. Accessed June 25; https://www.dropbox.com/s/upld9nylje56g1z/Concept-diagnostique-proposition.pdf?dl=0.
15. Gill-Body KM, Hedman LD, Plummer L, et al. Movement system diagnoses for balance dysfunction: recommendations from the academy of neurologic physical therapy's movement system task force. *Phys Ther*. 2021;101(9):pzab153. https://doi.org/10.1093/ptj/pzab153.
16. Quinn L, Riley N, Tyrell CM, et al. A framework for movement analysis of tasks: recommendations from the academy of neurologic physical therapy's movement system task force. *Phys Ther*. 2021;101(9):pzab154. https://doi.org/10.1093/ptj/pzab154.
17. Scheets PL, Sahrmann Shirley A, Norton B. Diagnosis for physical therapy for patients with neuromuscular conditions. *Neurol Rep*. 1999;23:158—169.
18. Scheets PL, Sahrmann SA, Norton BJ. Use of movement system diagnoses in the management of patients with neuromuscular conditions: a multiple-patient case report. *Phys Ther*. 2007;87(6):654—669. https://doi.org/10.2522/ptj.20050349.
19. Fritz JM, Brennan GP. Preliminary examination of a proposed treatment-based classification system for patients receiving physical therapy interventions for neck pain. *Phys Ther*. 2007;87(5):513—524. https://doi.org/10.2522/ptj.20060192.
20. Lam OT, Strenger DM, Chan-Fee M, Pham PT, Preuss RA, Robbins SM. Effectiveness of the McKenzie method of mechanical diagnosis and therapy for treating low back pain: literature review with meta-analysis. *J Orthop Sports Phys Ther*. 2018;48(6):476—490. https://doi.org/10.2519/jospt.2018.7562.
21. Sahrmann S, Azevedo DC, Dillen LV. Diagnosis and treatment of movement system impairment syndromes. *Braz J Phys Ther*. 2017;21(6):391—399. https://doi.org/10.1016/j.bjpt.2017.08.001.
22. Willy RW, Hoglund LT, Barton CJ, et al. Patellofemoral pain. *J Orthop Sports Phys Ther*. 2019;49(9). https://doi.org/10.2519/jospt.2019.0302. CPG1-CPG95.
23. Ludewig PM, Saini G, Hellem A, et al. Changing our Diagnostic Paradigm Part II: movement system diagnostic classification. *Int J Sports Phys Ther*. 2022;17(1). https://doi.org/10.26603/001c.30177.
24. Gordon J, Quinn L. Guide to physical therapist practice: a critical appraisal. *Neurol Rep*. 1999;23:122—128. https://doi.org/10.1097/01253086-199923030-00016.
25. Gedda M. *Décision kinésithérapique: identité, démarche, Chaînes Logiques*. Elseiver Masson; 2001.
26. Alrwaily M, Timko M, Schneider M, et al. Treatment-based classification system for low back pain: revision and update. *Phys Ther*. 2016;96(7):1057—1066. https://doi.org/10.2522/ptj.20150345.
27. Boissonnault W. Differential diagnosis: taking a step back before stepping forward. *PT Mag*. 2000;8(11):46—55.
28. Case K, Harrison K, Roskell C. Differences in the clinical reasoning process of expert and novice cardiorespiratory physiotherapists. *Physiotherapy*. 2000;86(1):14—21. https://doi.org/10.1016/S0031-9406(05)61321-1.
29. Norton BJ. Harnessing our collective professional power": diagnosis dialog. *Phys Ther*. 2007;87(6):635—638. https://doi.org/10.2522/ptj.2007.87.6.635.
30. American physical therapy association. APTA guide to physical therapist practice. APTA Guide to Physical Therapist Practice. Accessed June 25, 2021. https://guide.apta.org/.
31. Larousse É. Larousse.fr : encyclopédie et dictionnaires gratuits en ligne. Accessed June 25, 2021. https://www.larousse.fr/.
32. Merriam-Webster. Dictionary by Merriam-Webster: America's most-trusted online dictionary. Published 2021. Accessed June 25, 2021. https://www.merriam-webster.com/.
33. Miller EW, Ross K, Grant S, Musenbrock D. Geriatric referral patterns for physical therapy: a descriptive analysis. *J Geriatr Phys Ther*. 2005;28(1):20—27. https://doi.org/10.1519/00139143-200504000-00004.
34. Zimny NJ. Diagnostic classification and orthopaedic physical therapy practice: what we can learn from medicine. *J Orthop Sports Phys Ther*. 2004;34(3):105—109. https://doi.org/10.2519/jospt.2004.34.3.105. discussion 110-115.
35. Rosenbaum PL, Walter SD, Hanna SE, et al. Prognosis for gross motor function in cerebral palsy: creation of motor development curves. *JAMA*. 2002;288(11):1357—1363. https://doi.org/10.1001/jama.288.11.1357.
36. Sahrmann S. Are physical therapists fulfilling their responsibilities as diagnosticians? *J Orthop Sports Phys Ther*. 2005;35(9):556—558. https://doi.org/10.2519/jospt.2005.0109.
37. Vansant AF. Diagnosis and the human movement system. *Pediatr Phys Ther*. 2007;19(4):265. https://doi.org/10.1097/PEP.0b013e31815b5299.
38. van den Beld WA, van der Sanden GAC, Feuth T, et al. A new motor performance test in a prospective study on children with suspected myopathy. *Dev Med Child Neurol*. 2006;48(9):739—743. https://doi.org/10.1017/S0012162206001587.

39. Dean E. Oxygen transport deficits in systemic disease and implications for physical therapy. *Phys Ther*. 1997;77(2):187–202. https://doi.org/10.1093/ptj/77.2.187.
40. Noonan V, Dean E. Submaximal exercise testing: clinical application and interpretation. *Phys Ther*. 2000;80(8):782–807.
41. Rothstein JM. Patient classification. *Phys Ther*. 1993;73 (4):214–215. https://doi.org/10.1093/ptj/73.4.214.
42. Schenkman M, Bliss ST, Day L, Kemppainen S, Morse J, Pratt J. Multisystem model for management of neurologically impaired adults—an update and illustrative case. *J Neurol Phys Ther*. 1999;23(4):145–157.
43. World Health Organization. International classification of functioning, disability and health (ICF). Published 2018. Accessed June 28, 2021. https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health.
44. Campbell SK. Are models of disability useful in real cases? Pediatric case examples realized in research, clinical practice, and education. *Phys Ther*. 2006;86(6):881–887.
45. World Health Organization. Classification of diseases (ICD). Published 2019. Accessed June 28, 2021. https://www.who.int/standards/classifications/classification-of-diseases.
46. Charlin B, Lubarsky S, Millette B, et al. Clinical reasoning processes: unravelling complexity through graphical representation. *Med Educ*. 2012;46(5):454–463. https://doi.org/10.1111/j.1365-2923.2012.04242.x.
47. Tousignant-Laflamme Y, Houle C, Cook C, Naye F, LeBlanc A, Décary S. Mastering prognostic tools: an opportunity to enhance personalized care and to optimize clinical outcomes in physical therapy. *Phys Ther*. 2022;102(5):pzac023. https://doi.org/10.1093/ptj/pzac023.
48. Jiandani MP, Mhatre BS. Physical therapy diagnosis: how is it different? *J Postgrad Med*. 2018;64(2):69–72. https://doi.org/10.4103/jpgm.JPGM_691_17.
49. Jette AM. Reflections on the wisdom of profession-specific diagnostic labels. *Phys Ther*. 2021;101(6):pzab139. https://doi.org/10.1093/ptj/pzab139.
50. Brismée JM, Learman K, Riley SP, Swanson BT. On "Defining our diagnostic labels will help define our movement expertise and guide our next 100 years. Sahrmann, S. *Phys Ther*. 2021;101: pzaa196. https://doi.org/10.1093/ptj/pzaa196. *Phys Ther*. 2021;101(6):pzab090. https://doi.org/10.1093/ptj/pzab090.
51. Deusinger SS, Deusinger RH. Achieving diagnosis-based practice: a wicked problem in physical therapy. On "defining our diagnostic labels will help define our movement expertise and guide our next 100 years. Sahrmann, S *Phys Ther*. 2020;101(2). https://doi.org/10.1093/ptj/pzaa196. *Phys Ther*. 2021:pzab005. https://doi.org/10.1093/ptj/pzab005.
52. McClure P, Tevald M, Zarzycki R, et al. The 4-element movement system model to guide physical therapist education, practice, and movement-related research. *Phys Ther*. 2021;101(3): pzab024. https://doi.org/10.1093/ptj/pzab024.
53. Novak I, Morgan C, Fahey M, et al. State of the evidence traffic lights 2019: systematic review of interventions for preventing and treating children with cerebral palsy. *Curr Neurol Neurosci Rep*. 2020;20(2):3. https://doi.org/10.1007/s11910-020-1022-z.