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Health Promotion and Wellness in Neurologic Physical Therapy: Strategies to Advance Practice

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Abstract

Background and Purpose: Neurologic physical therapy (PT) can assist people with neurologic conditions and injuries to optimize their health and wellbeing by addressing barriers at the individual, relationship, community, and societal levels. The purpose of this special interest paper is to provide consensus-driven strategies to address barriers to implementing HPW-related neurologic PT practice.

Summary of Key Points: Environmental scan, literature review, and expert input were used to determine barriers and develop strategies. Barriers include lack of time; low knowledge, self-

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Presentations related to this work include the following:

1. ANPT Synapse Center Online continuing education course “Health Promotion & Wellness Strategies Applied to Neurorehabilitation.”
2. Two-day preconference course at the *Combined Sections Meeting of the American Physical Therapy Association.* January 2019 titled “Health Promotion and Wellness Strategies Applied to Neurorehabilitation.”
3. Related resources are shared on the ANPT HPW *webpage* (https://www.neuropt.org/practice-resources/health-promotion-and-wellness)

efficacy and awareness; client complexity; lack of HPW resources; as well as concerns regarding payment and scope of practice. Four key strategies emerged: (1) develop and disseminate a consensus-based scope of practice for HPW in neurologic PT; (2) increase knowledge of resources related to HPW; (3) promote delivery models for HPW-related neurologic PT; and (4) encourage advocacy, community building and partnership along the continuum of care.

Recommendations for Clinical Practice: Clinicians should practice to their full scope of HPW-related PT practice. This includes optimizing movement, including physical activity and fitness, as well as reinforcing the importance of healthy sleep, nutrition, stress, and smoking cessation. These activities address primary, secondary, and tertiary prevention. Clinicians are encouraged to report their experiences with HPW-focused delivery models and outcomes. Additional research is needed to understand the full impact of HPW on PT practice.

Health promotion and wellness (HPW) are critical to participation in valued activities and life roles.[1, 2] Neurologic physical therapy (PT) is a healthcare delivery mechanism that is ideally placed to assist people with life-changing neurologic conditions and injuries to optimize their health and wellness despite their condition.[3, 4] While there are various definitions, health promotion supports individuals, groups, or communities to enable the pursuit of and control over health improvements, prevention, and wellness.[1, 5] Wellness incorporates all dimensions of individual and group existence, including optimal physical and emotional health, spirituality, social connectivity, psychological, and intellectual well-being.[1, 5, 6] Furthermore, health is inclusive of quality of life and well-being, not merely the absence of disease.[1, 5–7]

Recent national and international efforts have called on PT to screen and address five core HPW components of healthy lifestyle behaviors: 1) physical activity, including lifestyle physical activity, structured exercise and sedentarism; 2) sleep; 3) stress; 4) nutrition; and 5) smoking.[6, 8, 9] Physical activity is “any bodily movement produced by skeletal muscles that results in energy expenditure.”[10] It can include basic activities of daily living or exercise, which is defined as “a subset of physical activity that is planned, structured, and repetitive” with an objective to improve or maintain physical fitness.[10] Physical activity is the HPW component most often addressed by PT, and its benefits are well-documented.[11, 12] However, the four other health behaviors also represent critical modifiable risk factors for the onset of non-communicable diseases (NCDs) such as heart disease and diabetes, which are important considerations in HPW neurologic PT practice.[13] Although underexplored in PT literature and practice, these five health behaviors are modifiable risk factors that have been associated with the onset or worsening of neurologic conditions and injuries such as stroke,[12, 14–22] spinal cord injury (SCI),[23–29] traumatic brain injury (TBI), [30–34] multiple sclerosis (MS),[35–38] and Parkinson disease (PD).[39–44] PT screening and health promotion activities targeting all five of these health behaviors may reduce risk of NCD and improve the health, wellness, as well as disease-specific and functional outcomes, of clients with neurologic conditions and injuries. Table 1 provides examples of the interactions between modifiable risk factors related to health behaviors, NCDs, and neurologic conditions.

Since 2016, the Academy of Neurologic Physical Therapy (ANPT) has addressed HPW through several initiatives: the HPW Task Force, the IV Step Conference,[3, 4] and the

2018 strategic plan, which identified the development of HPW resources as an action step “to advance practice, policy, research and education for those impacted by neurologic conditions.”[45] Numerous additional sources have supported the importance of changing the current PT paradigm from a reactive system focused primarily on ‘sick care’ to more proactive health-focused care.[6, 8, 9, 46]

Although critically important, there are many unaddressed barriers to practicing HPW-related PT. The barriers are organized here through the social ecological model at the individual (client), relationship (clinician-client dyad), community (facilities, organizations), and societal (payment, social determinants of health) levels.[47] Barriers related to clients include lack of interest or awareness that PTs provide HPW services, as well as condition complexity (i.e. comorbidities, cognition).[6, 46, 48] At the level of the clinician-client dyad, barriers include lack of clinician time and added burden of addressing HPW,[6, 46, 48] lack of physical therapist and referral source knowledge of the role of PT in HPW, and low clinician self-efficacy in specific HPW skills (i.e., motivational interviewing).[6, 46] Community-level barriers include lack of accessible facilities and trained exercise professionals within local community networks,[6, 49, 50] as well as fragmented HPW education resources across consumer and professional organizations.[6, 46] Societal-level barriers include payment concerns due to the misperception that the scope of PT practice does not include HPW due to traditional foci on restoration of function.[6, 46, 48] and the social determinants of health (SDOH).[51] While the SDOH can contribute to barriers across all levels of the social ecological model, they are most notable at the societal level. The SDOH include the domains of economic stability; education access and quality; healthcare access and quality; neighborhood and built environment; and social and community context. These domains can become barriers to the success of physical therapy, as well as PA and HPW, and increase health disparities.[51] The relative importance of these barriers may differ between clinicians, populations, and neurologic rehabilitation settings; thus, individually-tailored barriers assessments should be considered.[52]

Despite the importance of HPW, barriers have slowed implementation of HPW-focused care. The purpose of this special interest paper is to provide expert consensus-driven strategies to address the barriers to implementing HPW-related neurologic PT practice. These strategies sought to (1) develop and disseminate a consensus-based scope of practice for HPW practice in neurologic PT; (2) increase knowledge of resources related to HPW; (3) promote delivery models for HPW-related neurologic PT; as well as (4) encourage advocacy, community building and partnership along the continuum of care. Further, next steps are provided for clinicians and researchers to advance practice and address remaining knowledge gaps.

Methods

This paper represents the work of the ANPT HPW Task Force, which served under the Practice Committee beginning in 2016. The ANPT Board of Directors selected Task Force members after a call for applications sent to all ANPT members. The Task Force consisted of 7 individuals (clinicians, researchers, and educators), with an average 18±8 years of experience in the field and expertise across neurologic PT diagnoses, practice settings, classroom and clinical education, and HPW-related research areas (Table 2).

The HPW Task Force examined previously reported HPW priorities within general and neurologic PT practice, identified barriers, and executed an action plan. An environmental scan of existing literature and resources was conducted alongside consensus building with expert stakeholders. The environmental scan focused on investigating definitions of HPW, existing and needed resources related to HPW, the role of contemporary neurologic PT in HPW practice, barriers to HPW practice, and strategies to overcome these barriers. The environmental scan was conducted initially from 2016-2017, but remained iterative through 2020 as new information arose. Information gathered included international definitions,[1, 5, 7] position statements from national and international PT organizations,[3, 4, 8, 9, 53, 54] peer-reviewed literature on HPW practice and barriers, [2, 3, 6, 8, 9, 46, 48] and existing client-focused community resources available on the internet related to neurologic HPW.

Consensus building on the four strategies to address barriers to HPW practice included review, discussion and debate on the results of the environmental scan by HPW Task force members and consultation with other subject matter experts, including American Physical Therapy Association (APTA) leadership, ANPT leadership, and the APTA HPW Council. The APTA HPW Council is a networking and APTA-advising body who educate and advise health colleagues on the roles of PTs in health promotion, wellness, and prevention. The HPW Task Force synthesized this information, discussed and resolved any discrepancies through discussion at monthly meetings, a 2-day working meeting, and email communication. Ultimately a map of the four strategies to address the barriers identified was developed. Figure 1 illustrates this map depicting the relationship between the barriers and strategies, organized by the social ecological model.

1. Develop and Disseminate a Consensus-Based Scope of Practice for HPW Practice in Neurologic PT

A clear consensus statement on HPW neurologic PT practice addresses barriers related to lack of public awareness regarding the role of PT in HPW, as well as a lack of knowledge or interest in HPW-related PT practice by neurologic physical therapists, referrers, and clients (Figure 1). A clear scope of practice also assists legislative advocacy and payment efforts. The scope of HPW-related neurologic PT includes addressing primary, secondary and tertiary prevention of disease and injuries by: (1) optimizing movement, including the promotion of physical activity and fitness and (2) reinforcing the importance of healthy sleep and nutrition, stress management, and smoking cessation. Resources supporting this scope were the APTA Guide to Physical Therapy Practice 3.0,[5] the World Health Organization,[7] the Ottawa Charter for Health Promotion,[1] APTA House of Delegate (HOD) position statements,[53, 54] articles outlining consensus work from the World Confederation for Physical Therapy,[8, 9] and prior articles addressing HPW in neurologic PT practice.[3, 4]

Determining and disseminating expert consensus on HPW neurologic PT scope of practice helps to clarify controversial areas related to HPW in neurological PT practice, without attempting to extend practice. The first area of controversy is the role of PT in screening and addressing health behaviors beyond physical activity and fitness. The APTA HOD position statements are clear that nutrition, sleep, stress, and smoking are within PT scope of practice, as long as all local state licensing laws and regulations are followed and

the clinician is acting within their own personal scope of practice based on training and expertise.

Another controversial area of HPW in neurologic PT is the understanding of the PT role in primary, secondary, and tertiary prevention. Traditional PT falls under the scope of tertiary prevention, or reducing the negative impact of ongoing illness or injury to improve function and quality of life.[55] The role of neurologic PT in secondary prevention, or reducing the impact of disease and injury through screening and early intervention to prevent long-term problems has also been well-defined.[3, 55] Secondary prevention is particularly important based on the role of physical activity in maintaining function, promoting quality of life, and decreasing risk of cardiovascular complications and NCDs in people with neurologic diseases. The role of PT in primary prevention, or the prevention of a disease or injury from occurring, is less prevalent, but growing.[3, 6, 55] The most common examples of primary prevention in neurologic PT are the role of physical activity in cardiovascular and brain health, as well as community-based fall screenings for older adults, which could prevent traumatic spinal cord and brain injuries.

The APTA has been advancing the role of PT in primary prevention through position statements,[53, 54] the Guide to PT Practice,[5] the development of the Annual PT Visit and its associated training tools,[56] and support of APTA HPW Council. Clinicians who work in community wellness settings, cash-based PT settings, or who consult on population-level initiatives are at the leading edge of primary prevention efforts. However, current advocacy work by the APTA for payment of PT services as part of wellness and prevention programs will advance primary prevention in more traditional healthcare settings.[57] In addition to legislative advocacy, the APTA shares implementation plans for an Annual PT Visit across the lifespan, even in individuals with no known health conditions.[56] Within traditional neurologic PT settings, clinicians can schedule an Annual PT Visit to address secondary and tertiary prevention within the context of their neurologic condition. During those annual visits, screening for health behaviors will also address primary prevention of NCDs. For example, screening for and addressing nutrition and smoking in an individual with MS may be associated with reduced signs of disease progression,[36, 37] as well as primary prevention of NCDs such as obesity and lung disease. Although each payer is different, the initiation of direct access and reimbursable skilled maintenance therapy (see strategy 3) support neurologic physical therapists to address prevention in traditional healthcare settings. This article addresses ongoing barriers to HPW and prevention practice through the provision of implementation strategies and education. Physical therapists can then advocate to their healthcare administrators, referrers, and communities about their role in HPW and prevention.

2. Increase Knowledge of Resources related to HPW

Barriers related to low clinician knowledge, time, and self-efficacy are addressed by investigating and compiling existing clinician training and client education HPW resources (Figure 1) and addressing gaps in resources as identified. Compiling the existing resources also addresses barriers related to client knowledge and complexity, as well as the fragmented information available on community resources.

There is a growing number of high quality HPW education resources available for the general public and some for people with neurologic conditions. Reputable client-focused education resources include national and international professional organizations, consumer organizations, and government initiatives, as well as a variety of reputable disability advocacy and condition-specific organizations. The lack of awareness of these resources and spread of these resources across various organizations makes it difficult for practicing clinicians to find appropriate information quickly and may lead to duplicating work. Furthermore, many of the resources do not include the role of PT in HPW-related topics.

Existing educational resources that can facilitate HPW practice in neurologic PT are shared on the ANPT HPW webpage and summarized in Table 3. Increasing awareness of existing client-focused resources may reduce duplication of efforts by clinicians. Resources include education sheets, booklets, and videos developed by professional groups such as the APTA; the National Center on Health, Physical Activity and Disability (NCHPAD); and the Exercise is Medicine® (EIM) Campaign by the American College of Sports Medicine (ACSM). The ANPT HPW webpage includes up-to-date resources on each of the HPW topics, including examples from government initiatives and client-focused resources, such as nutrition materials provided by the U.S. Department of Agriculture, and healthy sleep information from the National Sleep Foundation. Using existing resources to support client education can benefit both clinicians and clients. They facilitate comprehensive rehabilitation and wellness programs and serve to link individuals to appropriate community organizations enhancing support and self-advocacy.

While we encourage the use of existing reputable HPW education resources (Table 3), many of these resources target clients rather than physical therapists. They often do not clearly address the role of PT in HPW-related topics (*e.g.* when, where, and how to intervene). Several clinician training tools have been developed by and for physical therapists, which are now available online through ANPT. These tools can help address clinician barriers related to lack of knowledge and time by providing information about HPW screening and assessment tools, as well as behavior change strategies. These tools include: (1) the ANPT HPW webpage,[58] (2) the ANPT Synapse Education Platform course, ‘Health Promotion and Wellness Strategies Applied in NeuroRehabilitation’ and (3) the ‘Bridging the Gap between PT and Lifelong Physical Activity and Exercise in People with Neurological Conditions Toolkit’.[59] Any new resources developed should build upon existing resources, ensure accessibility, and address health literacy.

The ANPT HPW webpage (https://www.neuropt.org/practice-resources/health-promotion-and-wellness)[60] was launched in 2019. It provides a platform for sharing reputable educational resources curated for physical therapists. Resources are organized as (1) clinician resources and tools, (2) client/patient resources and tools, (3) translation to practice setting tools, (4) foundational learning and key articles, and (5) links to information from the condition-specific ANPT Special Interest Groups on HPW topics. The HPW webpage is open to the public and updated regularly to share the most accurate and evidence-based information.

The ANPT Synapse Education Platform includes an online continuing education course titled ‘Health Promotion and Wellness Strategies Applied in NeuroRehabilitation.’ This course provides education on foundational HPW topics based on the US National Prevention Strategy (USNPS) health priorities as described by the APTA[54] and international peer-reviewed literature in PT education.[8] These concepts include the HPW domains of physical activity[3, 4] (structured exercise, sedentarism, and lifestyle physical activity), nutrition,[23, 36, 61] sleep health,[14, 35, 62] stress management,[15, 39, 63, 64] depression,[35, 65–67] smoking cessation,[16, 46, 68, 69] polypharmacy,[70, 71] and violence prevention.[72, 73] Additionally, the course provides clinical tools, including education on the role and scope of neurologic PT in HPW,[8, 53, 54, 74, 75] as well as outcome measurement and screening tools for HPW and physical activity.[76–79] The Synapse education course also includes information on health behavior change models and motivational interviewing-informed practice.[50, 80–84]

The ‘Bridging the Gap between PT and Lifelong Physical Activity and Exercise in People with Neurological Conditions’ document was developed originally by the ANPT Spinal Cord Injury Special Interest Group.[85] With author permission, it was adapted for general neurologic PT audiences with additional resource material. This toolkit now provides detailed objectives and rationale for promoting lifelong physical activity, how to assist clients in connecting back to PT after an episode of care, and multiple appendices that serve as educational materials, worksheets, and references. The aim of this toolkit is to facilitate PT-client dialogue and shared decision-making around values, goals, barriers, and action planning to promote healthy physical activity and exercise habits for individuals living with a neurologic condition or injury.

Knowledge and dissemination of HPW principles and practice is also growing in entry-level DPT education, although more work is needed. Magnusson et al, provides core competencies for population health, prevention, health promotion and wellness in PT which can guide and enhance education of new clinicians and help programs address HPW-related CAPTE standards (7D11, 7D14. 7D19h, 7D20, 7D23, 7D34, 7D39, 7D40, 7D41).[86] Rethorn et al.’s survey of DPT programs highlights the need for continued support of and resources for faculty to teach HPW.[87]

3. Promote Delivery Models for HPW-related Neurologic PT

The environmental scan and consensus building process led to identifying the importance of developing and disseminating delivery models for HPW-related PT practice to address barriers across all levels of the social ecological model. Sharing practical delivery models addresses barriers related to clinician time and knowledge; interest and awareness of clients and referrers; community exercise and education resources; as well as the understanding of the general public and third-party payers on how PT can address HPW (Figure 1). Four delivery models revealed in the environmental scan include: (1) acute to outpatient rehabilitation continuum model,[49] (2) proactive consultative ‘dental’ model,[88] (3) skilled maintenance model,[89] and (4) health promotion and wellness center/clinic model.[90, 91] Each model is defined, with delivery and documentation considerations in Table 4. Models may involve partnerships with evidence-based community programs, exercise professionals, caregivers (formal and informal), research studies, and community organizations.[92, 93] All

models should include screening for lifestyle health behaviors, including physical activity (*e.g.* structured exercise, sedentarism, and lifestyle physical activity), nutrition, smoking, sleep, and stress management. Clinicians should also consider how the SDOH can influence successful outcomes. Interventions should be delivered as appropriate per PT scope of practice, noting potential differences between practice settings, state regulations, and need for additional clinician training.

Table 5 summarizes examples of how each delivery model can be applied, with a focus on physical activity. The models are applicable across various neurologic conditions and injuries where documented evidence for the benefits of healthy lifestyle behaviors exists, including SCI,[94, 95] TBI,[96, 97] stroke,[90, 98–100] MS,[101–104] and PD.[105–107] With each delivery model, clinicians should measure and track physical activity outcomes appropriate to the setting. Measures may include aerobic fitness, accelerometer or pedometer-measured step counts (or wheelchair push counts),[108, 109] brief patient-reported outcome measures such as the Physical Activity Vital Sign,[110, 111] the Godin Leisure Time Exercise Questionnaire,[79] or the longer International Physical Activity Questionnaire to assess sedentary time.[112, 113] Physical therapists should also facilitate healthy behavior change[9, 46, 50, 114, 115] using the readiness to change questionnaire[116] and exercise self-efficacy scales.[114, 115] If a client cannot be independent with their exercise maintenance and progression despite behavior change strategies, clinicians should train and utilize caregivers and or extenders (e.g., physical therapist assistants or non-licensed exercise professionals as appropriate). In addition to physical activity, Table 5 includes screening tools and education regarding nutrition,[117] smoking,[8, 118] sleep,[119, 120] and stress management.[56, 121, 122] Screening and education should ensure client health literacy[123] and advocacy for connection to environmental and personal supports in the community and healthcare system.[56]

One healthy lifestyle behavior is presented in each model in Table 5, but these examples can be applied across all models due to similarities in screening and educational approaches. The following example highlights the similarities and differences for one HPW area, nutrition, in two delivery models. In an acute care setting, the physical therapist may ask informal screening questions regarding nutrition, and refer to an inpatient registered dietician for full assessment and intervention. The informal screen may be completed by asking ‘How many servings of fruit and vegetables do you typically eat per day?’ to gauge overall healthy eating habits; ‘Have you had any changes in your diet since entering the hospital?’ to assess changes and current intake; and ‘How much water have you drunk today?’ to determine hydration and potential impact on PT.[6, 56] The physical therapist then provides education on the importance of nutrition to PT, physical activity, function, and overall well-being, and requests a referral to a dietician as appropriate.[6] In contrast, in an outpatient proactive consultative dental model, nutrition may be assessed formally through a screening tool such as the ‘Starting the Conversation’ Tool or using similar informal screening questions as in acute care.[117] Depending on the results of the nutrition screening, the physical therapist may further explore readiness to change nutritional habits and provide general healthy eating resources from the U.S. Department of Agriculture consumer-facing nutrition website. The physical therapist can also request a referral to a registered dietician for further assessment and intervention if needed. Current payment limitations on dietary services in outpatient settings highlights the importance of screening

for HPW topics and providing appropriate referrals during acute rehabilitation when the service is more accessible. Screening resources, including interview questions, standardized tools, and frameworks, for assessing lifestyle health behaviors and readiness to change are available through several resources including the newly updated Annual PT Visit available through the APTA.[6, 8, 46, 56]

One common feature across all four delivery models is the need to approach PT with a strong foundation in behavior change techniques. Incorporating behavior change strategies into physical therapy requires knowledge of theories and models, as well as the ability to apply that knowledge in practice. Knowledge of the behavior change theories have been well summarized by Bezner and colleagues (2017).[50] They have also been summarized in the ANPT HPW Synapse Education series. Theories addressed include the transtheoretical model,[124] which includes aspects of readiness to change[125] and self-efficacy.[126] It is recommended that readers interested in health behavior change consider both self-study using seminal texts, such as that by Glanz and colleagues (2015) and continuing education courses.[127]

4. Encourage Advocacy, Community Building and Partnership along the Continuum of Care

The final strategy to improve delivery of HPW-related neurologic PT practice is through advocacy, community building and establishing partnerships along the continuum of care. This strategy addresses barriers related to payment, public interest and awareness on the importance of HPW and accessibility, as well as time and efficiency of the clinician related to ease of community referrals (Figure 1). Physical therapists are advancing the role of HPW in legislative efforts and partnerships with outside organizations. Additionally, physical therapists may help drive change to address SDOH through advocacy and population health initiatives. These relationships at the national and local level may be through governmental organizations, nonprofit organizations, or community wellness centers.

At the national level, the APTA has partnerships with ACSM's Exercise is Medicine® campaign and the Academy of Geriatric Physical Therapy's (AGPT) has a collaboration with National Council on Aging (NCOA). Additionally, the APTA is a partner of the Physical Activity Plan Alliance committed to implementing the National Physical Activity Plan. Other national PT groups addressing the need for advocacy include the APTA's HPW Council, the ANPT Advocacy and Consumer Affairs Committee, the ANPT Membership and Public Relations Committee, and the HPW Special Interest Group of the Academy of Geriatric Physical Therapy. Because important HPW partnerships can span neurologic and non-neurologic populations, APTA's HPW Council is an ideal avenue to facilitate communication of national and international efforts between groups.

One example highlighting the importance of cross-group communication is the recently developed population health, prevention, health promotion and wellness competencies for entry-level DPT practice.[86] The APTA"s HPW Council sponsored this document and communicate it to PT educators across specialty areas.[86]

At the local levels, clinicians may need to advocate with clinic administration and payers to set up processes to integrate HPW delivery models. For example, they should consider appropriate referrals, electronic documentation, and communication between providers. Further, they can enhance engagement and ease transitions to lifelong physical activity and exercise by connecting clients with local adaptive exercise trainers and evidence-based programs in their communities. There are at least 10 professional organizations that train exercise professionals to work with people with disabilities and medical conditions. Examples of these organizations include ACSM, American Council on Exercise, and NCHPAD. It is also important for clinicians to be aware of evidence-based exercise programs in their local communities. As part of the AGPT/NCOA partnership, tools were developed to help therapists understand and connect clients to evidence-based programs such as a Matter of Balance (Moving for Better Balance), Enhance Fitness, and NeuroFit.[128–130] Standardized implementation and training procedures ensure consistent delivery to maximize outcomes. Therapists are encouraged to follow the joint work of AGPT/NCOA to disseminate these evidence-based programs.[131]

Next Steps to Advance HPW Practice and Address Knowledge Gaps

To advance HPW-related neurologic PT practice, clinicians should practice to the full scope of PT practice within the various HPW delivery models presented, while being aware of state and local policies and personal expertise that could influence their care. They should use existing resources and develop partnerships with wellness organizations in their community. Additionally, the ANPT may consider national partnership development with consumer advocacy organizations to promote the role of PT in physical activity promotion. Clinicians are encouraged to document outcomes and share experiences through local and national education programs, case study manuscripts, communication with peers via the ANPT neuro listserv, and legislative advocacy through APTA's Legislative Action Center. Measuring outcomes and sharing knowledge are essential components of evidence-based practice. Barriers to HPW practice have been well-documented,[6, 46, 48] and thus sharing successful practical examples of implementation strategies and outcomes could enhance delivery world-wide.

Additional research is needed to address knowledge gaps related to HPW neurologic PT practice. The first recommendation for researchers is to develop, refine, and synthesize knowledge related to clinically-feasible, valid patient-reported and accelerometer-based measures of physical activity.[78, 79, 108, 109] These measures will have improved utility with a better understanding of their psychometric properties across populations. Publishing knowledge translation tools to facilitate real-world implementation of these measures could enhance the likelihood of success. Second, researchers studying traditional restorative PT interventions are encouraged to consider the impact of nutrition, sleep, smoking cessation, stress management, lifestyle physical activity and, sedentarism, as potentially impactful covariates in the study design. Knowledge translation research should examine the impact of PT-led HPW interventions on client-specific barriers, including readiness to change and self-efficacy. Additionally, research is needed to explore the role of the SDOH on PT outcomes, particularly environmental factors such as safe places for physical activity and healthy food.[132] Large-scale clinical trials on the role of neurologic PT in improving physical

activity and other lifestyle behaviors should measure outcomes related to the development of NCDs, hospitalization rates, quality of life, and participation. Finally, PT health services researchers may want to partner with payers to conduct demonstration projects related to PT for HPW.

Limitations

While this paper identifies and compiles important strategies to address barriers to HPW practice, limitations should be considered. The suggested strategies primarily target clinicians. The resources provided may not address problems experienced by clients in underserved communities or specific geographic areas. Additionally, limited information is included on how to change processes and policies at the level of the health systems or payers. Future work in these areas could ease the burden placed on clients, as well as the burdens on physical therapists delivering primary prevention or addressing population health. Finally, methodologic limitations include lack of a systematic review and lack of a formal Delphi process. Rather, environmental scan, narrative review, expert opinion, and informal expert consensus were used. Future work should develop systematic reviews and clinical practice guidelines as more evidence becomes available.

Conclusion

Shifting from a reactive care model to a proactive model of PT that includes HPW will take individual and collective efforts. Implementing the strategies identified here clarifies the role of PT to all stakeholders and addresses previously reported barriers to HPW practice. Physical therapists can help people be well despite living with a neurologic condition or injury. Individuals living with neurologic conditions need experienced and knowledgeable clinicians to optimize movement, health, and wellbeing.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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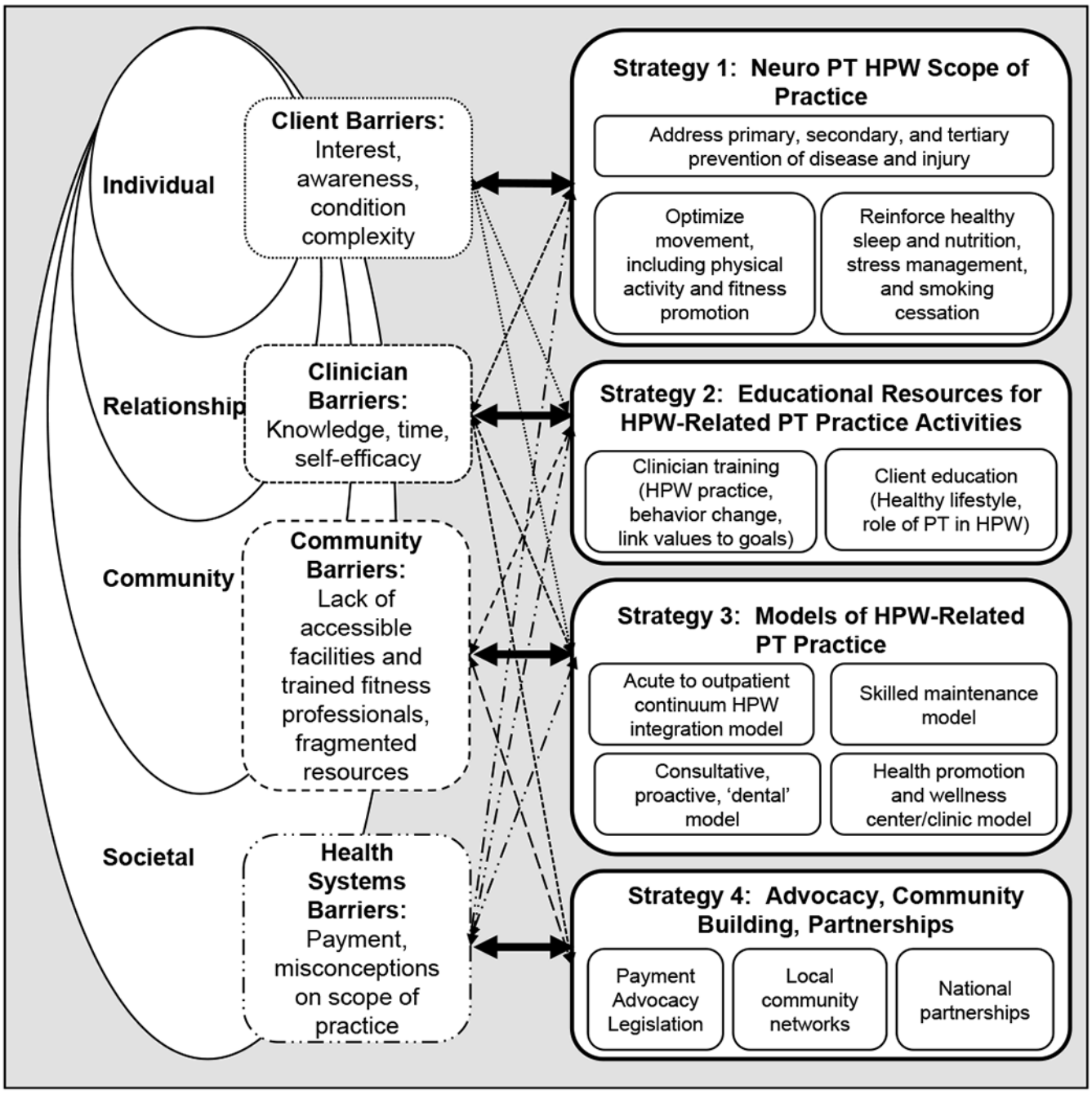

Figure 1. Map Connecting Barriers to Strategies Promoting HPW in Neurologic Physical Therapy.

Barriers identified in the literature were organized using the social ecological model (Left). Strategies identified by the ANPT HPW Task Force are summarized (Right). Each strategy target barriers at a specific level of the social ecological model; however, each barrier is addressed by multiple strategies, and multiple strategies address each barrier (Center bidirectional arrows.

Table 1:

Example relationships between neurologic conditions, noncommunicable diseases, and modifiable risk factors related to health behaviors that can be influenced by physical therapy.

Note: this is a non-exhaustive review of the topic.

Condition	Prevalence of noncommunicable disease or modifiable risk factors related to health behaviors in neurologic condition or injury	Modifiable risk factors or health behavior associated with increased risk of developing neurologic condition or injury (incidence)	Modifiable risk factors or health behavior associated with worse outcomes when one has the neurologic condition
Stroke	• Stroke doubles the risk of having dementia[21] • 50% prevalence of sleep disorders after stroke[14]	• Sleep impairment (insomnia) increases risk by 54%[18] • High amounts of physical activity reduces risk by 20-25%[12] • High cholesterol is associated with increased risk [19]	• Sedentary lifestyle may aggravate post-stroke fatigue[22] • Smoking increases risk of second stroke, MI, or death[17, 20]
SCI	• 55-68% of population is overweight or obese[23] • Increased risk of cardiovascular disease based on blood cholesterol values and hypertension[25] • Poor sleep and sleep related breathing disorders are greater in SCI than the general population[29]	• Number of new SCI caused by falls is increasing, along with increased average age of new SCI[24]	• Obesity may be associated with the development of upper extremity overuse injuries[26] • Nutritional status influences pressure ulcer closure in [27] • Pain and anxiety increase risk of developing chronic health conditions [28]
PD	• One-third less active than older adults.[42] • Sleep disorders, particularly REM behavior disorder, are common [43]	• People who are less physically active have a greater incidence of developing PD[41]	• More exercise is associated with slower decline in QOL and mobility[40] • Poor nutritional status is associated with poorer functional gains during rehabilitation.[44]
MS	• The prevalence of cardiovascular disease in patients over 60 years old is more than 40%.[36]	• Smoking may be associated with a 50% increase in MS risk compared to non-smoking[37]	• Relapse rates 2.6 times higher in MS patients with obesity, hypertension, and diabetes[36] • Higher accrual of lesions in those with poor diets[36] • Smoking contributes to an 80% increase in secondary-progressive MS risk[37]
TBI	• Sports-related concussions increase risk of sleep distubance[32] • Elderly individuals with a history of cancer may have worse outcomes of subsequent TBI[31]	• Complex relationships exist between TBI incidence/ prevalence with substance abuse, family violence, and social determinants of health[33, 34]	• Chronic smoking impairs post-TBI recovery[30]

Table 2.

Characteristics of Health Promotion and Wellness Task Force Members (N=7)

Credentials	**N (%)**
DPT	3 (43%)
NCS	4 (57%)
PhD	5 (71%)
CEEAA	2 (29%)
Professional Area of Expertise	
Research	3 (43%)
Entry-Level DPT Teaching	5 (71%)
Post-Professional Teaching	3 (43%)
Residency Director/Mentor	2 (29%)
Clinical Instructor	1 (14%)
Expert Clinician	4 (57%)
Diagnostic Expertise	
Stroke	4 (57%)
Spinal Cord Injury	1 (14%)
Brain Injury	3 (43%)
Parkinson’s Disease	1 (14%)
Multiple Sclerosis	1 (14%)
Other Neurodegenerative	1 (14%)
HPW-Related Expertise	
Research	5 (71%)
Entry-Level DPT Teaching	6 (86%)
Post-Professional Teaching	5 (71%)
Practice	5 (71%)

Abbreviations: CEEAA, certified exercise experts for aging adults; DPT, doctor of physical therapy; NCS, Board-Certified Clinical Specialist in Neurologic Physical Therapy; PhD, doctor of philosophy.

Table 3:

Sources of Educational Resources to Facilitate Physical Therapy Delivery of Health Promotion and Wellness Content to People with Neurologic Disorders

Resource Source	Types of Resources Provided	Example Organizations
National and International Organizations	• Summary of State Policies • Clinician networking groups • Clinician education (fact sheets, presentations, tool boxes, knowledge synthesis) • National initiatives including 'Exercise is Medicine' • Consumer education	• American Physical Therapy Association • World Confederation for Physical Therapy • American College of Sports Medicine • Preventive Cardiovascular Nurses Association • National Physical Activity Plan • World Health Organization • Center for Medicare Advocacy
Clinical Practice Guidelines Repositories	• Condition-specific guidelines may include information on physical activity • U.S. nutrition and physical activity guidelines	• APTA Evidence-Based Practice Resources • National Institute for Health and Care Excellence (U.K.) • ParkinsonNet • U.S. Office of Disease Prevention and Health Promotion
Consumer Organizations	• Consumer education (websites, webinars, fact sheets, exercise programs) • Evidence-based health programs	• National Multiple Sclerosis Society • Parkinson's Foundation • American Stroke Association • United Spinal Association • Brain Injury Association • Evidence-based health programs at the Y (YMCA) • National Center on Health, Physical Activity and Disability by Centers for Disease Control and Prevention (NCHPAD) • National Sleep Foundation
Government Initiatives (United States)	• Consumer education (websites, fact sheets, videos) • Information for healthcare providers and exercise professionals • Virtual training programs • Activity tracking programs	• National Institute on Aging • Move Your Way by Office of Disease Prevention and Health Promotion • Centers for Disease Control and Prevention Programs for Addressing Social Determinants of Health • MyPlate by U.S. Department of Agriculture

Note: Please see the ANPT HPW Website for updated links to these resources[60]

Table 4:

Physical Therapy Delivery Models Incorporating Health Promotion and Wellness

Model*	**Model 1 = Acute to Outpatient Continuum HPW Integration Model**	**Model 2 = Consultative, Proactive, 'Dental' Model**	**Model 3 = Skilled Maintenance Model**	**Model 4 = Health Promotion and Wellness Center/Clinic Model**
Operational definition	• Introduce adapted lifestyle physical activity in acute rehab. • Foster independent community physical activity and enhance fitness in outpatient rehab. • Transition to semi-supervised or independent exercise through continuum of care.[49]	• Provide expertly tailored exercise prescription, monitoring, & progression. • Goals to restore, improve, or maintain function and to optimize movement. • Use proactively after diagnosis or for long-term monitoring in chronic disease.[88]	• Medicare coverage of SNF, HH, and OP services for *skilled care* to improve, maintain or prevent or slow further deterioration.[89] • Functional gains not required. • Must be reasonable, necessary care that cannot be delivered by non-skilled personnel.	• Exercise programs are completed with assist and progressed with PT monitoring or supervision as needed. • Part of a traditional rehab center, a stand-alone non-profit organization, or a community center. • Services provided by licensed or non-licensed professionals.[90, 91]
Delivery considerations*	• Gradually fade visit frequency following restorative care to monitor transition to community exercise. • Consider transitioning to model 2-4, as needed. • Traditional payment model	• Brief episode of care (~1-4 visits). • Follow-up episodes recommended every 3-12 months, depending on self-efficacy, independence, or risk of functional decline. • Traditional payment model	• Bimonthly or monthly visits to monitor and modify optimizing movement programs.[133] • Weekly visits if patient is at high risk for rapid change. • Medicare-specific model definition may not apply to all private insurers	• Transition outpatient visits to community center outside healthcare delivery system. • Common barriers include accessibility and affordability. • Commonly cash or philanthropy-funded.
Documentation considerations**	• Document prior level of physical activity. • Create transition plans through continuum. • Document education and stage of change.	• Document medical need for regular exercise and skilled exercise prescription. • Evaluate and document physical activity and exercise FITT-VP.	• Justify *skilled* care clearly (*i.e.*, medical need for exercise monitoring and adjustments due to complex and/or changing medical and functional needs).	• Vary depending on state practice act and individual center/clinic policies. • Evaluate and document physical activity and exercise FITT-VP.

*__Common delivery considerations:__ All models should include screening for physical activity (structured exercise, sedentarism, and lifestyle physical activity, as well as nutrition, smoking, sleep, and stress management. Delivery should include HPW outcome measures, facilitating behavior change, and training caregiver and or extenders (e.g., PTA, non-licensed exercise professionals) as needed.

**__Common documentation considerations:__ All models should document physical activity and exercise assessments, as well as the need for skilled PT to assess, prescribe, monitor, and progress exercise in clients with neurologic conditions.

Abbreviations: FITT-VP, frequency intensity time type volume and progression; HH, home health; OP, outpatient; Rehab, rehabilitation; SNF, skilled nursing facility

Note: These delivery models may be modified with health policy changes over time.

Table 5:

Application Examples of Health Promotion and Wellness Delivery Models

Model	Model 1 = Acute to Outpatient Continuum HPW Integration Model	Model 2 = Consultative, Proactive, 'Dental' Model	Model 3 = Skilled Maintenance Model	Model 4 = Health Promotion and Wellness Center/Clinic
Client Examples (non-exhaustive)	Individual with new injury (*e.g.* stroke, TBI, SCI) or illness in acute inpatient rehabilitation	Individual newly diagnosed with neuro-degenerative condition (*e.g.* PD, MS) or individual with chronic condition (stroke)	Individual with significant impairment or chronic condition at high risk of functional decline (*e.g.* ALS, advanced PD, MS)	Individual with subacute injury or illness requiring significant community support (*e.g.* subacute SCI, stroke)
Physical Activity and Exercise Promotion within PT Delivery Model	Educate on the importance of lifestyle physical activity. Facilitate peer mentor visit describing active lifestyle. In OP PT, introduce to progressive walking programs and adaptive exercise equipment. Fade frequency of visits while investigating community-based physical activity resources. Transition to model 4.	Baseline evaluation of walking, balance, physical activity, and exercise participation. 3 additional visits every 2-4 weeks to increase duration and intensity of structured exercise program in community gym with trainer. Condition-specific exercise programs. Re-check in 6 months.	OP or HH PT 1-2/ week. Transitioned to 1-2x/month during periods of stability, to provide *skilled* care to monitor for changes in functional status. Problem-solve, modify, and progress exercise, recommend equipment. Family/client education and training.	Refer to a specialized medical fitness center for post-rehabilitation exercise. Center is staffed by PT, OT, and exercise physiologists who provide a fitness evaluation, and design and assist as needed in an individualized exercise plan. Center is accessible and has condition-specific equipment (e.g. standing frame, body weight support, FES cycle, and wheelchair treadmill.
Cost of Physical Activity Plan of Care within PT Delivery Model	Insurance co-pays, followed by model 4 costs.	Insurance copays, community exercise expenses (gym, trainers, PD-specific exercise class).	Insurance co-pay	Monthly gym membership (Medicare Silver Sneakers coverage), cash-pay for additional services with scholarships available (personal training/exercise therapy).
Example of physical activity measures	• Prior activity level with PA measure	• Physical Activity Vital Sign[110, 111] • Godin Leisure Time Exercise Questionnaire[79] • Exercise Self-Efficacy[114, 115] • Accelerometry-based measure[108, 109]	• International Physical Activity Questionnaire-Long form[112, 113] • Accelerometry-based measures[108, 109]	• Physical Activity Vital Sign[110, 111] • Godin Leisure Time Exercise Questionnaire[79] • Exercise Self-Efficacy Scale[114, 115] • Accelerometry-based measures[108, 109]
Example Additional HPW Measures and/or Screening Questions * Can be Used in Any Model **	**Nutrition** • How many fruits and vegetables do you eat per day? • Starting the Conversation Tool[117] • Readiness to Change[116] **Sleep** • How many hours of sleep do you regularly get? Do you feel well rested when you wake up? • Pittsburgh quality sleep index[119] • Stop-Bang Questionnaire for Sleep Apnea[120] **Stress** • How is your stress level? • Perceived stress scale-14[121] • Brief-COPE[122] **Smoking** • Do you smoke? (non-smoker, current smoker, stopped smoking in the past 6 months)? • Readiness to Change[116]			
Additional HPW Education Component Examples Can be Used in Any Model ** **See** table 3 **for**	**Nutrition** • Recommend well-balanced diet and dietician consult. • Educate on how diet impacts energy and activity. **Sleep** • Educate on sleep hygiene. • Educate on reducing sedentarism and increasing lifestyle PA. • Recommend peer and caregiver support groups. Caregiver respite services if needed. **Stress** • Educate on stress management, possibly including meditation and mindfulness. • Recommend counseling or peer support groups **Smoking**			

Model	Model 1 = Acute to Outpatient Continuum HPW Integration Model	Model 2 = Consultative, Proactive, 'Dental' Model	Model 3 = Skilled Maintenance Model	Model 4 = Health Promotion and Wellness Center/Clinic
educational resource materials.	• Use MI-informed communication strategies • Use the 5A's and 5R's model for smoking cessation education and support.[8, 118] • Educate on importance of smoking cessation • Recommend peer support groups			

*See Bezner 2015 and APTA Annual PT Visit for additional tools & questions.[6, 56]

**The additional HPW measures, screening questions, and education should be applied across all the delivery models as needed for their clients. Education should begin with assessment or screening questions, dialogue to understand readiness to change, and should proceed using principles of shared decision-making.

Abbreviations: ALS, amyotrophic lateral sclerosis; CVA, cerebrovascular accident; FES, functional electrical Stimulation; HH, home health; OP, outpatient; OT, occupational therapy; PD, Parkinson's disease; PT, physical therapy; SCI, spinal cord injury; y/o, years old