

Content:

Commentary on Horst R. et al. from the members of the res. com -----> **1**
Reply from Horst R. et al.-----> **3**
We searched and found: PNF supporting articles-----> **3, 4 +6**
From the WCPT + Physiopedia: The Bangkok Declaration on physical activity and health-----> **5**, and physiotherapy exercises -----> **6**

August 2017

Newsletter IPNFA research committee

In the last newsletter we presented the abstract of a publication from Renata Horst et al. We pointed out that some of the described therapy is different compared to the definitions from the IPNFA. We felt the urge to write a commentary on that publication. The commentary was accepted by the publishing journal “Clinical Rehabilitation” and was first published online at May 3, 2017. You can read our commentary on page 1 and 2 from this newsletter.

Furthermore this newsletter has a focus on publications we found in our web-search in the past few months that support the use of proprioceptive and 3 dimensional training. These will be taken into the update of the literature list after the AGM in Warsaw, October 11-14, 2017.

I wish a joyful reading. Fred.

Letter to the Editor, Clinical Rehabilitation

Commentary on Horst R et al. Activity- vs. structural oriented treatment approach for frozen shoulder: a randomized controlled trial <https://doi.org/10.1177/02692155177063>

First we like to compliment the authors on their efforts for addressing the issue to determine best practice for the treatment of “frozen shoulder” and incorporating an activity based treatment regime. Nevertheless we need to address some remarks and comments in the hope the authors can clarify and provide some further details.

In the introduction it is stated that pain causes non-use or “freezing” and is an expression of “learned non-use. This seems to suggest that a frozen shoulder is the result of pain and non-use, although frozen shoulder has been defined as “adhesive capsulitis” resulting in pathological and morphological changes in the capsule of either inflammatory or fibrosing origin.¹ This pathological process leads to pain and limitation of range of motion (ROM) and has been described in three phases, 1 “freezing”, 2 “frozen” and 3 “thawing”.^{2,3} It is advocated to provide physiotherapy in stage 2 and 3 to avoid pain provocation in the stage 1, the inflammatory phase.³

In the methods is a lack of inclusion criteria. No information on the duration of the complaints is provided. Since there are indications in the literature about the self-limiting character of the disease,^{1,4} this is an important criterion to determine in which stage the patients might be. In general frozen shoulder has been described having an average duration of one to three years,⁵ and is more common among women.¹ In this presented study of Horst et al. the prevalence of women is lower than reported in other studies. This all might have influenced the outcomes of the study with an intervention time of only two weeks, which is short in relation to the time of natural course of this disease.

The authors suggest in the introduction that “conventional methods for treatment” only focus on improving functioning of body structures and that according to these treatments the ability to perform activities is automatically recovered. As reference has been used: Kaltenborn 2005 and Buck, Beckers and Adler 2010. Neither of these two references claim an automatic recovery of perform-

ing activities. Moreover the last reference is a standard work for Proprioceptive Neuromuscular Facilitation (PNF), and is used as an instruction book for the “how to do...patterns, techniques and facilitation principles”. The build-up of rehabilitation is much more complex. PNF has been described and defined as a comprehensive rehabilitation approach based upon motor learning with a focus on all components of the international classification of functioning (ICF).⁶ When looking at table 2 the “structural oriented therapy” is described as “practicing particular PNF pattern...” without any focus on functional task setting as advocated by Smedes et al. 2016, Horst 2008 and Adler, Beckers and Buck 2014.⁶⁻⁸ On the other hand in the “activity oriented therapy” we recognize under no. 1,3,4,6 and 7 from table 2, procedures advocated in the comprehensive rehabilitation approach as advocated in the mat activities program of the PNF-concept.^{7,8}

In the discussion the authors only addressed the lack of differentiation between primary and secondary frozen shoulder in the in- and exclusion criteria. No further discussion is provided on the duration of symptoms, nor on the underlying pathological changes in the specific tissue. Neither has been addressed that in “real life” therapy, therapist often adopt an eclectic approach of several different intervention techniques focusing on both, body structure level and activities and in this way complying with the ICF.^{9,10} We agree on the view that activity oriented therapy will have influence on (regaining) cortical representation and that this representation might be at risk in patients who avoid doing activities because of pain. We mainly disagree with the way the “conventional therapy”, here the PNF approach, has been set against an activity oriented therapy mimicking PNF approach. Studies addressing only single components of a comprehensive rehabilitation concept (like PNF) have been criticized before.⁶

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To inform you in a complete way about our view on rehabilitation interventions using the PNF-concept, we naturally also provide you with the reaction from the authors of Horst R et al. on the commentary.

Reply from Horst R. et al.

We appreciate our colleagues' comments and questions regarding our article "Activity- vs. structural oriented treatment approach for frozen shoulder: a randomized controlled trial."

We are aware of the standard definition and gender distribution of "frozen shoulder." Our interest was to question whether the inflammation process, which causes structural damage, or cortical reorganization induced by sub cortically controlled protective mechanisms of the brain is mainly responsible for limited performance of daily life activities.

The literature shows that the prevalence of women is higher than men in patients with "frozen shoulder." However, gender distribution for the occurrence of an illness cannot be compared to rehabilitation outcome. There is no current literature describing significant differences in rehabilitation outcome. The results in our study lead to the same conclusion: gender has no significant influence. The only influencing factor was the method of treatment (structural vs. activity oriented).

The authors of the commentary point out that the duration of therapy was short in regard to the healing process for "frozen shoulder." Our focus was, which therapy methods influenced the rehabilitation process more effectively during the healing process, especially on a long-term basis. Apparently, the methods seem to have been misinterpreted:

Table 2 of our study, especially points 5 and 7, describe the difference precisely. The literature of Buck et al.¹ and Horst² also provide detailed insight as to how they differ. The narrative review the commentary authors cite refers to methods which were previously found to be especially effective to increase ROM in the shoulder.³ These methods were implemented in the structural oriented group of our study in which the results showed that these methods were not as effective as those performed in the activity-oriented group. In conclusion, we wish to emphasize that the experienced therapists who performed the therapy in the structural-oriented group were certified by International Association for Proprioceptive Neuromuscular Facilitation (IPNFA) instructors as well as certified manual therapy instructors and treated according to the current international curriculae.

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Moreira et al.

Diagonal movement of the upper limb produces greater adaptive plasticity than sagittal plane flexion in the shoulder. *Neuroscience Letters* 2017,643:8–15

Abstract

The motor rehabilitation is based on exercises that involve various joints and muscle groups. One such treatment method is Proprioceptive Neuromuscular Facilitation (PNF), which involves diagonal movements simulating many activities of daily living. The objective of this study was to investigate the differences between PNF and shoulder flexion movements performed without the diagonal component (i.e., only in the sagittal plane) using beta band absolute power as a measure of plasticity. The study included 30 volunteers randomized into three groups (control, PNF, and FLEX), with electroencephalographic signals captured before and after the performance of the task. The PNF group showed an increase in beta band absolute power in both hemispheres, indicating greater plasticity than that seen in the FLEX group. Therefore, PNF seems to be capable of promoting cortical adaptations that lead to the recruitment of both hemispheres, thus influencing cortical organization in more complex tasks.

Park SE, Min KO, Lee SB, Choi WS, Kim SH.

Effect of eye movements and proprioceptive neuromuscular facilitation on balance and head alignment in stroke patients with neglect syndrome J. Phys. Ther. Sci. 28: 596–601, 2016

Abstract.

[Purpose] The purpose of this study was to assess the effect of eye movements and proprioceptive neuromuscular facilitation (PNF) on patients with neglect syndrome.

[Subjects and Methods] The subjects were randomly allocated to 2 groups: the eye movements (EM) group; and the PNF with eye movements (PEM) group. The program was conducted five times each week for 6 weeks. Balance (both static and dynamic) and head alignment (craniovertebral angle and cranial rotation angle) were measured before and after testing.

[Results] In measurements of static balance, the EM group showed significant improvement in sway length and sway area when examined in the eyes-open condition, but not when examined in the eyes-closed condition. The PEM group showed significant improvement when examined under both conditions. In the assessment of dynamic balance, both groups showed significant improvement in measurements of sway areas. With respect to head alignment, there were no significant differences pre- and post-testing in either the craniovertebral angle or the cranial rotation angle in the EM group, but the PEM group showed significant differences in both measurements.

[Conclusion] These results suggest that in stroke patients with neglect syndrome, PNF with eye movements, rather than eye movements alone, has a greater positive effect on balance and head alignment.

Key words: Eye movements, Proprioceptive neuromuscular facilitation, Neglect syndrome

Park SI, Moon SH

Effects of trunk stability exercise using proprioceptive neuromuscular facilitation with changes in chair height on the gait of patients who had a stroke J. Phys. Ther. Sci. 28: 2014–2018, 2016

Abstract.

[Purpose] The purpose of this study was to identify the effects of trunk stability exercise using proprioceptive neuromuscular facilitation with changes in chair heights on the gait of stroke patients.

[Subjects and Methods] The subjects of this study were 11 stroke patients. The intervention method was trunk stability exercise using proprioceptive neuromuscular facilitation with different chair heights (50, 60, and 70 cm). These exercises were performed 5 times per week for 6 weeks. Gait velocity, cadence, stride length, gait cycle, and stance phase duration were used to measure gait function.

[Results] Significant changes in gait velocity, cadence, and stride length were observed on the affected side. However, no significant changes in gait cycle and stance phase were observed on the affected side.

[Conclusion] These results indicate that trunk stability exercise using proprioceptive neuromuscular facilitation with change in chair heights were effective in improving gait velocity, cadence, and stride length on the affected side. However, in this study, no significant changes were observed in gait cycle and stance phase on the affected side. Therefore, various interventions for stroke patients should be investigated in further studies.

Key words: Trunk stability, Proprioceptive neuromuscular facilitation, Stroke

The Bangkok Declaration

JULY 4, 2017 BY [SCOTT BUXTON](#) [LEAVE A COMMENT](#)

Nov 28 2016



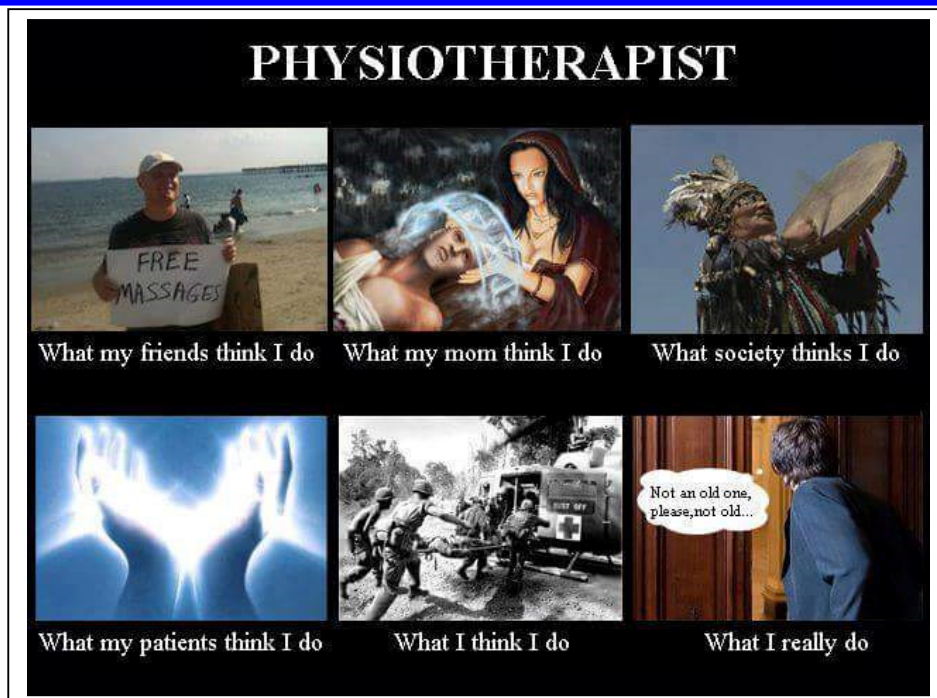
As Physios/PTs, movement and exercise is our core belief. Through exercise we help people combat depression, obesity, joint pains, stress and let them do the things which make them happy, allow them to thrive and enjoy life. Sadly evidence is pointing towards the global population becoming more inactive and suffering the consequences of lifelong NCDs ([learn more here](#)).

The WHO has been aware of this issue for the past decade and they have been encouraging health departments all of the world to act now. In 2004 they released their *Global Strategy on Diet, Physical Activity and Health* and have since built upon this with the 2013 *Global Action Plan on NCDs*. Exercise and physical activity featured heavily in both documents and both compliment our profession greatly. We are the exercise experts after all.

[ISPAH](#) (The International Society for Physical Activity & Health) have been integral to the push for people to become more active and to take part in regular exercise, Alongside them, the WHO are a powerful ally in the fight against inactivity.

This is demonstrated by the recent [Bangkok Declaration on Physical Activity & Health](#) which aims to:

- advocate for investment and actions at country, regional and global levels
- provide a case for partnerships with sectors inside and outside of health
- detail six actions which could advance progress toward achieving WHO targets of increasing physical activity and reducing NCD burden by 2025
- contribute to mitigating climate change, reducing inequalities and supporting more sustainable cities and communities in a rapidly urbanising world.



Aman JE, Elangovan N, Yeh,IL, Konczak J.

The effectiveness of Proprioceptive training for improving motor function. a systematic review.

Frontiers in human Neuroscience 2015,8; 1-18, article 1075. doi: 10.3389/fnhum.2014.01075

Objective:

Numerous reports advocate that training of the proprioceptive sense is a viable Behavioral therapy for improving impaired motor function. However, there is little agreement of what constitutes proprioceptive training and how effective it is. We therefore conducted a comprehensive, systematic review of the available literature in order to provide clarity to the notion of training the proprioceptive system.

Methods:

Four major scientific databases were searched. The following criteria were subsequently applied: (1) A quantified pre- and post-treatment measure of proprioceptive function. (2) An intervention or training program believed to influence or enhance proprioceptive function. (3) Contained at least one form of treatment or outcome measure that is indicative of somato-sensory function. From a total of 1284 articles, 51 studies fulfilled all criteria and were selected for further review.

Results:

Overall, proprioceptive training resulted in an average improvement of 52 % across all outcome measures. Applying muscle vibration above 30 Hz for longer durations (i.e., min vs. s) induced outcome improvements of up to 60 %. Joint position and target reaching training consistently enhanced joint position sense (up to 109 %) showing an average improvement of 48 %. Cortical stroke was the most studied disease entity but no clear evidence indicated that proprioceptive training is differentially beneficial across the reported diseases.

Conclusions:

There is converging evidence that proprioceptive training can yield meaningful improvements in somatosensory and sensorimotor function. However, there is a clear need for further work. Those forms of training utilizing both passive and active movements with and without visual feedback tended to be most beneficial. There is also initial evidence suggesting that proprioceptive training induces cortical reorganization, reinforcing the notion that proprioceptive training is a viable method for improving sensorimotor function.

Keywords: balance, joint position sense, kinesthesia, proprioception, somatosensory, stroke, therapy

WCPT partner, Physiotherapyexercises.com, has recently made its exercises available in Portuguese: www.physiotherapyexercises.com/?lang=portuguese.

Physiotherapyexercises.com is a freely available web software produced by physical therapists that enables PTs around the world to generate exercise programs for their patients. It currently contains over 1,000 exercises for people with different injuries and disabilities. Each exercise is illustrated and has accompanying explanatory text. The library of exercises continue to grow through the support of sponsors.

As well as Portuguese, it is also available in Arabic, Chinese, English, French, German, Norwegian, Polish, Portuguese, Russian, Spanish and Vietnamese.

