February 2017

Newsletter IPNFA research committee

At the meeting in Munich, Gordana Poscic presented an overview of approximation articles. Now the research committee collected all these articles and started to judge them to define whether they are suitable as background information and/or evidence for the approximation we use in the PNF-concept. We like to present the first results of that.
*The first article is referring **Knott** and **Voss** and to the master thesis of **Sue Adler** from 1982. There we see how much we owe to our senior and honorary members!!*
I wish a joyful reading. Fred.

The research committee would like to introduce the three (3) following abstracts. The first one is addressing a decrease in postural sway as a result of approximation. The abstract does not refer to manual applied approximation, although the full text is!!!
The 2nd text is about the effect of weight reduction on gait and gait pattern, indirectly indicating effects when increasing weight (approximation). The third text is addressing three different treatment approaches for children with cerebral palsy. The MAST has components that simulate a kind of approximation.

RATLIFFE KT, ALBA BM, HALLUM A, JEWELL MJ.

Effects of Approximation on Postural Sway in Healthy Subjects. *Phys Ther.1987Apr;67(4):502-6*

The effect of approximation on the postural sway of healthy subjects wearing a weighted belt around their pelvis was measured. Twenty subjects between the ages of 23 and 30 years stood on a polyurethane foam platform that amplified their postural sway and were filmed from a lateral view. All subjects wore markers over their mandibles, hips, and knees and were filmed three times with the weighted belt worn on a randomly selected trial. Frames from a 10-second interval of film from each trial were studied, and the summed displacement at each bony landmark between each frame of film was calculated. A significant decrease in displacement at the mandible ($p < .02$) was found when the weighted belt was worn. The decrease in displacement was not significant at the hip or knee.
Approximation was shown to decrease the postural sway of healthy subjects.
Further study is indicated to investigate the effect of approximation on patient populations.
Key Words: Physical therapy, Posture.

Free download available on: https://academic.oup.com/ptj/article/67/4/502/2728196/Effects-of-Approximation-on-Postural-Sway-in click on the pdf icon and save the article

Sylos-Labini F, Lacquaniti F, and Ivanenko YP ***Human Locomotion under Reduced Gravity Conditions: Biomechanical and Neurophysiological Considerations***. *BioMed Research International Volume 2014 (2014),*

Reduced gravity offers unique opportunities to study motor behavior. This paper aims at providing a review on current issues of the known tools and techniques used for hypo gravity simulation and their effects on human locomotion. Walking and running rely on the limb oscillatory mechanics, and one way to change its dynamic properties is to modify the level of gravity. Gravity has a strong effect on the optimal rate of limb oscillations, optimal walking speed, and muscle activity patterns, and gait transitions occur smoothly and at slower speeds at lower gravity levels. Altered center of mass movements and interplay between stance and swing leg dynamics may challenge new forms of locomotion in a hetero gravity environment. Furthermore, observations in the lack of gravity effects help to reveal the intrinsic properties of locomotor pattern generators and make evident facilitation of non-voluntary limb stepping. In view of that, space neurosciences research has participated in the development of new technologies that can be used as an effective tool for gait rehabilitation.

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Mahani MK, Karimloo M, Amirsalari S **Effects of Modified Adeli Suit Therapy on Improvement of Gross Motor Function in Children With Cerebral Palsy** *Hong Kong Journal of Occupational Therapy*, 2011;21(1):9-14.

Abstract

Objective: This study aimed to investigate the effects of the Modified Adeli suit therapy (MAST) on improvement of gross motor function in children with cerebral palsy (CP).

Methods: Thirty-six children with CP assigned by match pairs to three equal groups such as the MAST, the AST, and the Neurodevelopmental Treatment. They were treated for 4 weeks, 2 hr/d,
5 d/wk. All children were tested by the Gross Motor Function Measure (GMFM) at baseline, immediately before and 16 weeks after treatments.

Results: All groups had improvement in the GMFM after treatment ($p < .01$) and there were significant differences among groups ($p < .01$). In the follow-up study, no significant improvement in the GMFM was seen within groups ($p > .05$), but again there were significant differences among groups ($p < .01$).

Conclusion: The MAST was more effective than using either the AST or the Neurodevelopmental treatment on improvement of gross motor function in children with CP after treatment and at follow-up.

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PNF described and offered in various manners, keep your mind critical, when reading papers and advertisement…“

While searching for interesting issues and topics, the research committee ran into various offers for therapeutic intervention that use PNF different as advocated by the IPNFA. **We strongly want to point out that not all offers are IPNFA recognized** (e.g. see bottom of this page). That PNF patterns have their own “life” is not unfamiliar, but it requires attention from the “PNF-world”, hence from the IPNFA and its representatives to point out that **PNF** is a **comprehensive rehabilitation concept** based upon motor learning principles. *(PNF-Philosophy on www.ipnfa.org and Smedes F. et al. The PNF-concept; the state of the evidence, a narrative review. Phys Ther. Rev. 2016;21(1):17-31).*

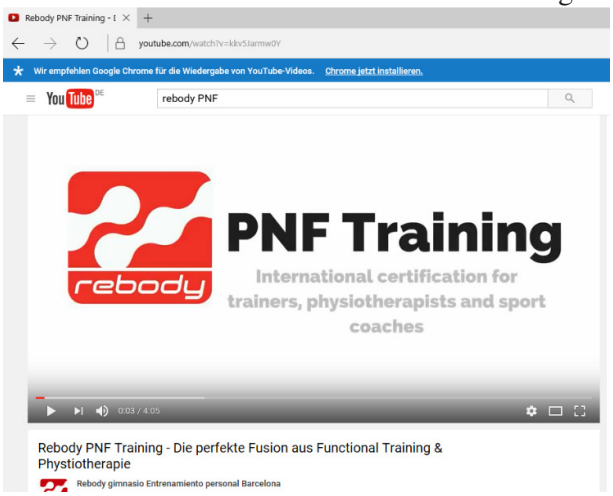
An interesting article just published online from Mrs. Renata Horst is describing PNF as a structure oriented therapy. Here we like to point out that the therapy is compared to an activity oriented approach. The IPNFA is advocating the PNF-Concept also as an activity oriented comprehensive approach.

Horst R et al. Activity- vs. structural-oriented treatment approach for frozen shoulder: a randomized controlled trial. Clinical rehabilitation, First Published January 13, 2017
DOI: 10.1177/0269215516687613 http://journals.sagepub.com/doi/10.1177/0269215516687613

Abstract

Objective: To compare the short- and long-term effects of a structural-oriented (convential) with an activity-oriented physiotherapeutic treatment in patients with frozen shoulder.
Design: Double-blinded, randomized, experimental study.
Setting: Outpatient clinic.
Subjects: We included patients diagnosed with a limited range of motion and pain in the shoulder region, who had received a prescription for physiotherapy treatment, without additional symptoms of dizziness, a case history of headaches, pain and/or limited range of motion in the cervical spine and/or temporomandibular joint.
Interventions: The study group received treatment during the performance of activities. The comparison group was treated with manual therapy and proprioceptive neuromuscular facilitation (conventional therapy). Both groups received 10 days of therapy, 30 minutes each day.
Main measures: Range of motion, muscle function tests, McGill pain questionnaire and modified Upper Extremity Motor Activity Log were measured at baseline, after two weeks of intervention and after a three-month follow-up period without therapy.
Results: A total of 66 patients were randomized into two groups: The activity-oriented group (n = 33, mean = 44 years, SD = 16 years) including 20 male (61%) and the structural-oriented group (n = 33, mean = 47 years, SD = 17 years) including 21 male (64%). The activity-oriented group revealed significantly greater improvements in the performance of daily life activities and functional and structural tests compared with the group treated with conventional therapy after 10 days of therapy and at the three-month follow-up ($p < 0.05$).

Furthermore there are various offers of training with PNF, often focusing on general fitness.



As an example we like to point at:
Rebody- PNF training

A trainer fills halls at PT exhibitions, he is known in Europe, the near east and Asia. Mr. Panos Pantas, also fills huge courses with his concept, based on PNF. He is a graduated biochemist and since 20 years personal trainer (see his homepage).
Check this out on youtube:
https://www.youtube.com/watch?v=kkv5Jarmw0Y
https://www.youtube.com/watch?v=CuaMaBihmhU

From the WHO:

10 facts on physical activity

Reviewed February 2017

A lack of physical activity is a significant risk factor for noncommunicable diseases (NCDs) such as stroke, diabetes, and cancer. Less and less physical activity is occurring in many countries. Globally, 23% of adults and 81% school-going adolescents are not active enough.

Getting people to move more is a key strategy for reducing the burden of NCDs, as articulated in WHO's *Global Action Plan for the Prevention and Control of NCDs 2013-2020*. The plan calls for a 10% reduction in physical inactivity by 2025, which contributes to achieving the Sustainable Development Goals (SDGs).

WHO provides recommendations for the minimum amounts of activity for all age groups for improved health, but it is important to know that doing some physical activity is better than doing none. Inactive people should start with small amounts of physical activity, as part of their daily routine, and gradually increase duration, frequency, and intensity over time. Countries and communities must also take action to provide individuals with more opportunities to be active.

To read the 10 facts please visit: http://www.who.int/features/factfiles/physical_activity/en/

There click on the photo of fact 1, then go through from 2 to 10.

From the WCPT (World Confederation for Physical Therapy) the following information:

The WCPT provides help in applying Evidence Based Practice (EBP). On their website they offer various documents to help physiotherapist in developing their skills in EBP. We the research committee from the IPNFA advice to read their valuable EBP overview and keynotes on critical appraisal skills for reading scientific publications and articles. Visit the following link: http://www.wcpt.org/node/100039 or just click on the links at the bottom of this section.

WCPT Keynotes | **EBP:** Critical appraisal skills

With more and more information becoming available to physical therapists, much of it on the Internet, it is increasingly important to be selective in what you read.
In a series of three Keynotes, Joan M Walker provides a step-by-step approach to assessing how useful an article will be to your practice.
The first paper looks at the value of *review articles*, how to assess their quality, and how to select useful papers simply by reading the abstract. The second looks in more detail at the *criteria* a physical therapist should use when determining whether a *review article or original research* is worth reading.
The final third paper provides advice on how to assess the *statistical validity* of a study.

- EBP: an overview
- Reading tips for the clinician: how to tell whether an article is worth reading
- Reading tips for the clinician: criteria for deciding the quality of an article
- Reading tips for the clinician: are study results good enough to be generalised?

In the field of gait and gait training the PNF-concept offers a wide range of therapeutic strategies.
How much evidence for therapeutic goal setting do we provide?
Maybe the following text might help us in defining specific goal setting in gait training in specifically patients suffering from MS and having issues with gait. Can we determine the disturbed gait pattern and act in the treatment accordingly?
A good read is recommended for the rehabilitation in this specific area. Please read this interesting piece of research.

Kempen JCE, Doorenbosch CAM, Knol DL, de Groot V, Beckerman H. **Newly Identified Gait Patterns in Patients With Multiple Sclerosis May Be Related to Push-off Quality**. Phys Ther. 2016; 96(11):1744-52

Background. Limited walking ability is an important problem for patients with multiple sclerosis. A better understanding of how gait impairments lead to limited walking ability may help to develop more targeted interventions. Although gait classifications are available in cerebral palsy and stroke, relevant knowledge in MS is scarce.

Objective. The aims of this study were: (1) to identify distinctive gait patterns in patients with MS based on a combined evaluation of kinematics, gait features, and muscle activity during walking and (2) to determine the clinical relevance of these gait patterns.

Design. This was a cross-sectional study of 81 patients with MS of mild-to-moderate severity (Expanded Disability Status Scale [EDSS] median score_3.0, range_1.0 –7.0) and an age range of 28 to 69 years.

Method. The patients participated in 2-dimensional video gait analysis, with concurrent measurement of surface electromyography and ground reaction forces. A score chart of 73 gait items was used to rate each gait analysis. A single rater performed the scoring. Latent class analysis was used to identify gait classes.

Results. Analysis of the 73 gait variables revealed that 9 variables could distinguish 3 clinically meaningful gait classes. The 9 variables were: (1) heel-rise in terminal stance, (2) push-off, (3) clearance in initial swing, (4) plantar-flexion position in mid-swing, (5) pelvic rotation, (6) arm-trunk movement, (7) activity of the gastrocnemius muscle in pre-swing, (8) M-wave, and (9) propulsive force. The EDSS score and gait speed worsened in ascending classes.

Limitations. Most participants had mild-to-moderate limitations in walking ability based on their EDSS scores, and the number of walkers who were severely limited was small.

Conclusions. Based on a small set of 9 variables measured with 2-dimensional clinical gait analysis, patients with MS could be divided into 3 different gait classes. The gait variables are suggestive of insufficient ankle push-off.

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The logic in health care: