

## Effect of Proprioceptive Neuromuscular Facilitation in Functional recovery of Patient's with Stroke-A review

**Aditi Chaturvedi\***

JSS College of Physiotherapy, Mysore,  
Karnataka, India

\*Corresponding author: Aditi Chaturvedi

✉ chaturvedi.aditya4@gmail.com

JSS College of Physiotherapy, 454 Devi Clinic  
MG Road Landmark Mobile Palace, 570004,  
Mysore, Karnataka, India.

Tel: 9731580731, 9731580731

Fax: 9731580731

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### Abstract

**Background:** PNF has been used for very long time for the functional improvement of stroke. In this review functions were selected according to the ICF (International Classification of Functioning, Disability and Health) corsets in the domain of Activity and Participation.

**Aim:** The purpose of this study is to review the effectiveness of PNF in stroke for functional recovery of patients.

**Method:** PubMed and Google scholar was searched using the following strategy- Language- English, Time period- all, Keywords- PNF, stroke, gait, balance, functional recovery. Inclusion criteria- RCT, meta-analysis, CASP- 80%.

**Conclusion:** This finding provides important aspects regarding the use of PNF in functional recovery of stroke, in various functional activities according to the ICF corsets, as PNF helps in major areas like gait, co-ordination and balance.

**Implications:** There is no enough clear evidence on the use of PNF, although there are reviews that state use of specific techniques for specific goals. Further studies are required to see the use of various PNF techniques as a whole or individually. Until then PNF technique can be used in clinical practice as there is no report of adverse events.

**Keywords:** PNF; Functional recovery; Stroke; Gait

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### Introduction

WHO define stroke as "acute onset of neurological dysfunction due to abnormality in cerebral circulation with resultant signs and symptom that corresponds to involvement to focal area of brain lasting more than 24 hours". PNF has been used for very long time for the functional improvement of stroke. The purpose of this study is to review the effectiveness of PNF in stroke for functional improvement of patients. In this review, functions were selected according to the ICF corsets in the area of activities and participation are as follows.

### Methods

Pub med and Google scholar was searched using the following strategy (**Tables 1 and 2**):

English articles between 2011-2015.

Inclusion criteria - RCT, Meta-Analysis.

CASP 80% rating.

### Results

PNF is a collection of treatment. It includes various patterns and techniques. Rhythmic initiation, rhythmic stabilization, slow reversal, agonistic reversal, stabilizing reversal is few of the PNF

**Table 1** The ICF corsets in the area of activities and participation.

Activities and Participation
• Copying
• Rehearsing
• Acquiring skills
• Writing
• Changing basic body position
• Maintaining a body position
• Transferring oneself
• Walking
• Moving around in different locations
• Moving around using equipment
• Toileting
• Caring of body parts

**Table 2** The PNF techniques which are effective in functional recovery according to this review.

Author	Subjects and duration	Results	Conclusion	Evidence	PNF techniques
Kim KD et al. [1]	Sub- 26 3 days a week for 30min each time over a period of 6 weeks.	the effects of neck exercises using PNF showed significant improvement	PNF-based short neck flexion exercises appear to be effective at improving swallowing function of stroke patients with dysphagia.	Level 1	PNF based short neck flexion exercises.
Shinde K et al. [2]	9 months	Trunk Lateral Flexion Range of Motion (TLF ROM) and Tinetti Test (TT) showed results (P<0.05) in the PNF training group	PNF technique should be considered in acute and sub-acute stroke rehabilitation	Level 1	Rhythmic initiation, slow reversal, Agonistic reversal.
Kumar et al. [3]	Sub- 30 30 min for 3 days a week for a total duration of 4 weeks.	PNF techniques have effect on gait parameters as well as functional mobility as compared to conventional therapy in patients with hemiplegia.	PNF is a very beneficial technique for improving functional independence in patients with strokes especially in area like locomotion	Level 1	Rhythmic initiation, slow reversal, agonistic reversal for pelvis. Each technique was given for 10 min.
Seo KC et al. [4]	Sub- 40 30 minutes, five times a week for four weeks.	Temporal parameters decreased more in the experiment group. Spatial parameters increased significantly in experiment group.	PNF based walking exercise on a ramp is effective in enhancing gait performance.	Level 1	PNF based walking exercise, PNF gait pattern training.
Kim Y et al. [5]	Sub- 40 10 minutes, Five times a week for six weeks.	Experimental group showed improvement on both affected and non-affected side, control group showed improvements only on the non-affected side.	TSE using PNF performed by stroke patients were effective at improving FRT and the muscle activities of the soleus and quadriceps.	Level 1	Stabilizing reversal, Rhythmic stabilization.
Akosile Co et al.	Sub – 34 Twice weekly for 8 weeks.	The mean total EFAP was significantly lowered ( $p \leq 0.05$ ) from 115.10 seconds pretest to 88.67 seconds at the post-test measurement.	PNF is recommended as an effective treatment for functional ambulatory gains in stroke rehabilitation.	Level 1	PNF patterns as described by Knott and Voss, D1 flexion and extension D2 flexion and extension for UE and LE.

techniques which are effective in functional recovery of patients with stroke.

## Discussion

PNF is a collection of treatment, it includes various techniques and patterns. Rhythmic initiation and stabilization slow reversal, agonistic reversal, stabilizing reversal, are few of the PNF techniques which are effective in functional recovery according to this review.

## Conclusion

These findings provide important aspects regarding the use

of PNF in functional recovery of stroke, in various functional activities according to the ICF corsets, as PNF helps in major areas like gait, balance.

## Future Implications

There is no enough clear evidence on the use of PNF, although there are reviews that state use of specific techniques for specific goals. Further studies are required to see the use of various PNF techniques as a whole or individually. Until then PNF technique can be used in clinical practice as there is no report of adverse events.

## References

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