
PNF STRETCHES

**AN INITIATIVE OF SKILLS
DEVELOPMENT**

BY

**CENTER FOR WELLNESS.
ISTE**



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ABOUT THE AUTHOR

The author, Malini Chaudhri, currently manages a Start Up, Center for Wellness, in Delhi. India.

She has been sponsored to Westport, CT, USA, where she pursued postgraduate CE courses in massage therapies. Sports Massage was an essential part of her research. She has also consulted with golf and referrals from a neurosurgeon.

In 2008 she successfully managed the UK Ministry qualification HABIA INDIA, which introduced level 2 and 3 massage of the National Occupational Standard. Sports Massage was included.

She has worked as a professor in South China Normal University before 1990, and acquired a license from WHO in acupuncture. She integrates Asian bodywork methods in her practice.

She has practiced Sports massage in short bursts in hospitals, clinics and with

physiotherapy departments and managed a personal clinical practice. She has consulted with world class sportsman in hockey, polo and golf.

In 2016 she published a comprehensive technical illustrated manual on Amazon, *Sports massage, Skills Development. In Spa therapies framework*. This is also a course on Eliademy. Two other books published by her are related to sports rehabilitation. These are *Low level laser for Physical Therapists*. Edited by Jan Tuner, and *Shiatsu. Skills Development. Spa therapies framework*.

THE COMPANY

This book belongs to a START UP, Center for Wellness, dedicated to develop skills in natural therapies in poorer nations. The Company has been verified by International Accreditation Organization, which received successful candidacy for accreditation In 2014.Delhi

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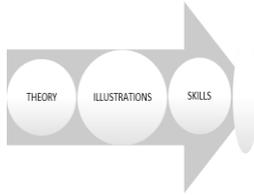
INTRODUCTION TO PNF STRETCHES

PNF STRETCHES is an essential technique that orthopaedic surgeons and Sports massage practitioners use on athletes and exercisers to diagnose and prevent muscle injury. Muscles are stretched according to a formal category of processes which gives muscles energy to perform best during exercise and sports. Isolated muscle groups are targeted in relation to antagonist muscles and reciprocal activity. Isotonic and isometric contractions are managed during therapy with precise skills in stabilization and muscle lengthening.

Variou models of therapy and integrated sciences are discussed collectively in this manual for range of knowledge and therapeutic potential.

THEORY AND APPLICATIONS

This manual is a concise technical study of



the theory behind this essential technique.

Master all skills related to voice command, client handling and assessment through easy to manage illustrations and practical instructions.

Follow levels of competency in practise from beginners to intermediate.

Follow more diverse theories and systems that may be applied to assessment and plan of care, including embryology and special sense therapy.

Develop enhanced skills and range in therapies related to sensory systems.

Manage maintenance and aftercare based on exercise

QUOTE

“To cure what need not be endured and to endure what cannot not be cured”

BKS IYENGAR on Yoga

DEDICATION

This book is dedicated to the loving memory of my father, Vijay Chaudhri, born to great titles and nobility, who lived the last seven years of his life after stroke humbly with the support of therapy.

TABLE OF CONTENTS

- 1) PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION . FUNDAMENTALS
- 2) STANDARDIZING THERAPY.
- 3) ILLUSTRATIONS
- 4) PATTERNS
- 5) REVIEW
- 6) PNF TECHNIQUES
- 7) REVIEW
- 8) SENSORY TECHNIQUES. ROOD' S
- 9) SPECIAL SENSES TECHNIQUES.
- 10) EMBRYONIC BODY TYPES
- 11)MEDICAL THERAPUTIC ERECISE AND AFTERCARE

1.

*PROPRIOCEPTIVE
NEUROMUSCULAR*



*FACILITATION.
FUNDAMENTALS*

FUNDAMENTALS:

UNDERSTANDING PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION

DEFINITION

PNF is associated with neuromuscular (involving nerves and muscles) proprioception (to do with sensory receptors that inform with movement and position of the body) in which the skilled therapist gives support (facilitation) to assess and improve functional performance.

DEVELOPING FULL POTENTIAL

There is an underlying knowledge that all humans have an untapped anatomical potential. A runner can improve his running, a weight lifter can improve his strength. Similarly, nerves and muscles may be managed to improve condition and performance through skilled support. The therapist during a session can mobilize the patient's reserves to be fully challenged through the stretch which in turn improves movement, speed, coordination and strength at the highest possible functional level.

Muscles communicate with the nervous system by relaying messages from both sensory and motor neurons. Sensory neurons send sensory information—sight, sound, feeling, and more—to the brain or spinal cord.

Motor neurons, on the other hand, are responsible for stimulating a muscle contraction. When the communication

between a motor neuron and muscle is reduced, the muscle relaxes. One of the ways this happens is through activation of golgi tendon organs.

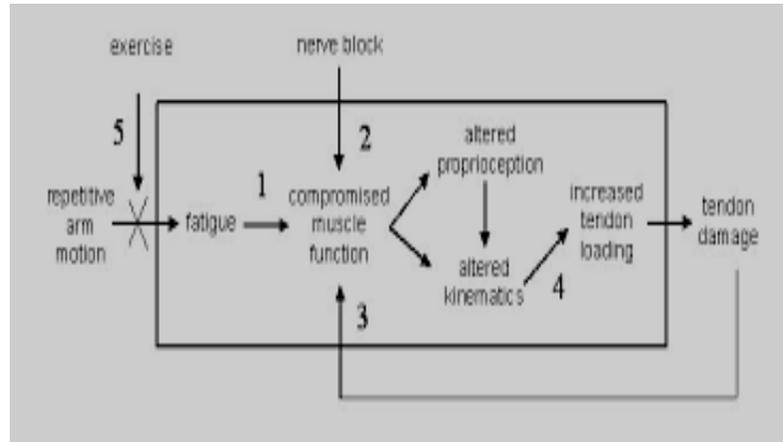
Golgi tendon organs (GTOs) are sensory receptors located within muscle tendons. GTOs respond to changes in muscle tension and provide feedback to the brain to regulate muscle force. This is also a self-regulated safety mechanism: When tension in the muscle reaches levels that could pose a potential risk of injury, GTOs are stimulated to cause the muscle to relax.

PNF stretching works because the isometric contraction activates the GTO, ultimately allowing the muscle to lengthen and experience a greater ROM. This technique utilizes "autogenic inhibition," which relaxes a muscle after a sustained contraction is held for 6 seconds. This process allows the treated muscle to be stretched beyond its initial maximum capacity, and lengthened over successive attempts.

PNF can also work through what's called "reciprocal inhibition," which means one side of a joint relaxes to allow for the contraction of the other. Voluntary contraction of the opposing muscle has been shown to reduce activation levels in the target muscle, allowing it to lengthen and achieve greater gains in ROM.

In a nutshell, this covers the body's processes to improve mobility.

Essentially the system capitalizes on the sensory organization of the body and its integration into musculature. All muscles have sensory and motor nerve sensitive focal points that alter muscle shape, tension, pain, movement and flexibility. This minute physiology with major influence on the physiology of muscle, especially in relation to sports, is controlled via Proprioceptive neuromuscular facilitation.



MOTOR CONTROL AND LEARNING

The therapist must practice using principles of motor control and motor learning at level of body structures to implement a therapeutic programme.

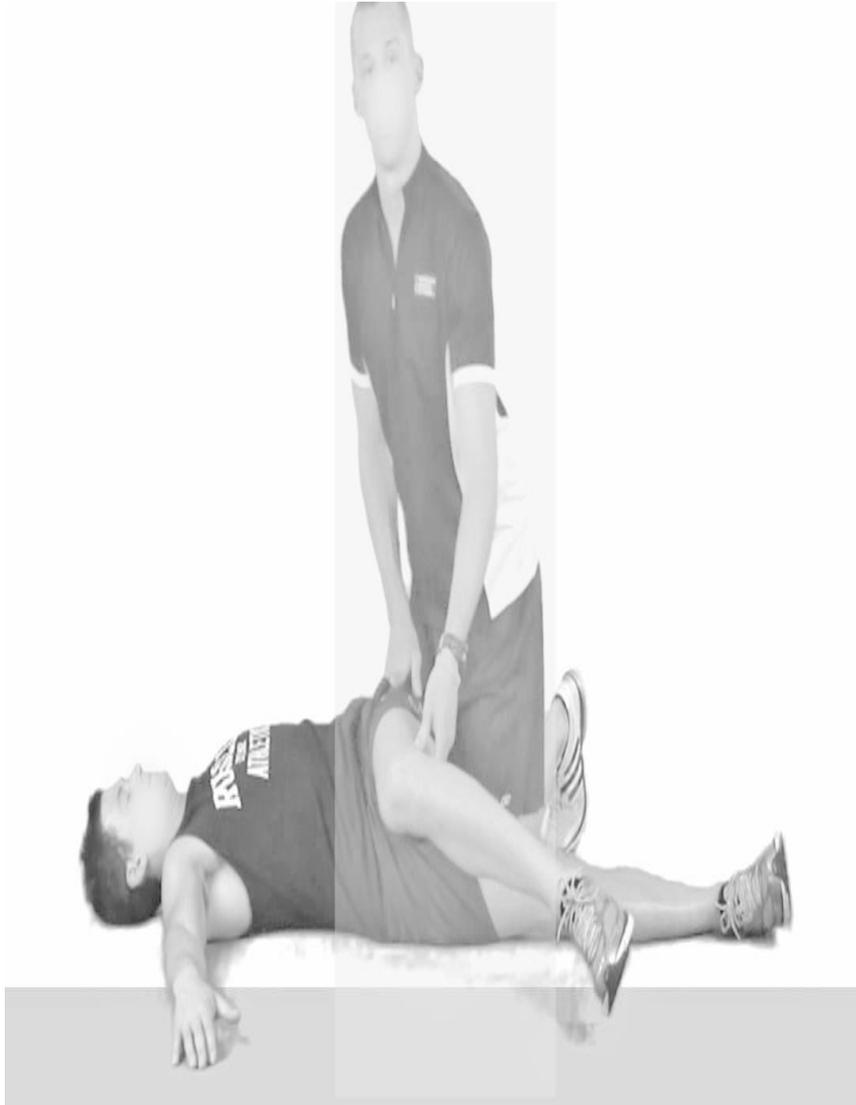
Whereas sometimes isolated muscle groups are targeted, the therapist must place the therapy in relation to the whole individual and their socio-cultural environment, their physical and psychological condition. Motor learning principles in use are repetition.

PNF AND FACILITATION are managed in stages of motor control variations based on movement patterns applied resistance based on client' s tolerance.

PHYSIOLOGY OF A STRETCH REFLEX.

PNF STRETCHES ARE BASED ON A STRETCH REFLEX OF MUSCLE AND TENDON





Rotation of hip and irradiation. Adduction of limb from hip. Stretch of hip rotators.



Stretch and contract- relax of abductors with lower limb abduction. Hip extension



Trunk rotation and full upper body stretch against resistance.



Stretch of upper limb across patterns.



Contract relax with rotation of lower limb flexion



Stretch of latissimus dorsi with pressure applied

Stretch and pressure to trunk obliques.



Contract relax with rotation through lower limb movements

5.

PNF TECHNIQUES



STRENGTHENING TECHNIQUES

- * Rhythmic initiation
- Repeated contraction
- Slow reversal
- Slow reversal-hold
- Rhythmic stabilization
- Rhythmic rotation

STRETCHING TECHNIQUES

- Contract relax
- Hold relax

COMPETENCY MAP FOR PNF

STRENGTHENING

Technique: Rhythmic Initiation

Description: Synchronized unidirectional movements with emphasis on agonists

Purpose: Initiate movements, Teach pattern
Synchronize components

Neurophysiology: Decreased alpha motor neuron excitation

Technique: Repeated contraction

Description: Isotonic contraction of Agonist.
In case of weakness, repeated stretch into pattern

Purpose: Facilitate weak agonist

Neurophysiology: Stretch reflex. Irradiation

Technique: Slow Reversal

Description: Concentric contraction of agonist without relaxation between reversals

Purpose: Increase agonist motion.
Strengthen agonist/antagonist.

MANUAL MUSCLE TESTING PROCEDURES

Key to Muscle Grading

	Function of the Muscle	Grade		
No Movement	No contractions felt in the muscle	0	0	Zero
	Tendon becomes prominent or feeble contraction felt in the muscle, but no visible movement of the part	T	1	Trace
Test Movement	MOVEMENT IN HORIZONTAL PLANE			
	Moves through partial range of motion	1	2-	Poor-
	Moves through complete range of motion	2	2	Poor
	ANTIGRAVITY POSITION			
	Moves through partial range of motion	3	2+	
Test Position	<i>Gradual</i> release from test position	4	3-	Fair-
	Holds test position (no added pressure)	5	3	Fair
	Holds test position against slight pressure	6	3+	Fair+
	Holds test position against slight to moderate pressure	7	4-	Good-
	Holds test position against moderate pressure	8	4	Good
	Holds test position against moderate to strong pressure	9	4+	Good+
	Holds test position against strong pressure	10	5	Normal

Modified from 1993 Florence P. Kendall. Author grants permission to reproduce this chart

8

***SENSORY
TECHNIQUES***



Sensory integration is a theory founded and popularized by Jean Ayres, in 1973, but based on the existing premises of Rood and others.

It is based on three main assumptions:

1) Individuals receive information from their bodies and the environment, process and interpret the information within their CNS and use the information in a functional manner.

2) Individuals with sensory processing will demonstrate problems in planning and execution of adaptive responses.

3) Individuals who receive stimulation within a meaningful context will have the opportunity to integrate the sensory information, demonstrating more efficient motor skills and adaptive behaviors (Long and Toscano, 2002).

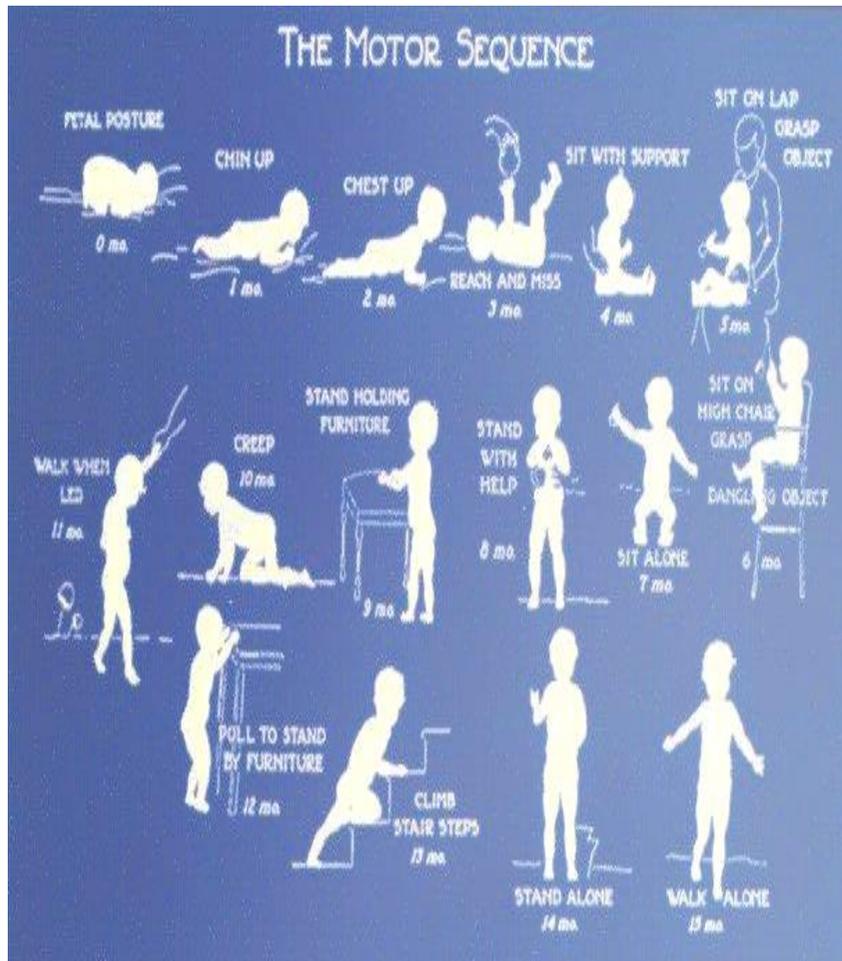
Sensory integration is a theoretical intervention frame of reference that is built

around the relationship between the brain and behaviour.

Sensory stimulation activities emphasizing the tactile, proprioceptive, and vestibular systems are selected to engage the individual in the meaningful, self directed context.(Ayres,1973; Bundy et al.,2002)

Intervention activities are often directed at promoting antigravity flexion or extension, increasing proprioception and a sense of gravitational security, promoting equilibrium responses and balance, and enhancing tolerance of and integration of vestibular stimulation.

Roods Technique Is an important segment in sensory technique applications in therapy characterized by Sensory techniques in therapy and developmental sequences of human growth in movement.



Sensory Stimulation Techniques are based on

1>Sensory Inhibition

Processed by stimulus that causes motor neurons to drop away from the discharge zone and away from the spinal cord.

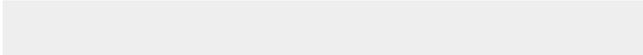
- Sensory Inhibition results in decreased excitability of motor neurons.
- Muscle spasticity can be decreased.

This technique normalizes muscle tone from a flaccid state through icing, fast brushing, tapping, stroking or quick stretch.

And

2 >Sensory Facilitation

Processed by an impulse causing the recruitment and discharge of additional motor neurons in the spinal cord.



SUMMARY AND FOCUS

This section provides range and spectrum in knowledge of techniques associated with neuromuscular facilitation, but is not a complete treatise for therapists.

Each theorist has a somewhat different approach, assessment technique, and intervention strategies. Most neurodevelopmental approaches require specialized training. These theorists use a behavioral learning approach to motor control based on the sequence normal developmental.

The listings in this section are for mildly injured to greatly injured cases of muscle or CNS damage, that is associated with sports injuries. However the full spectrum of each technique has to be researched and practised with complete support.

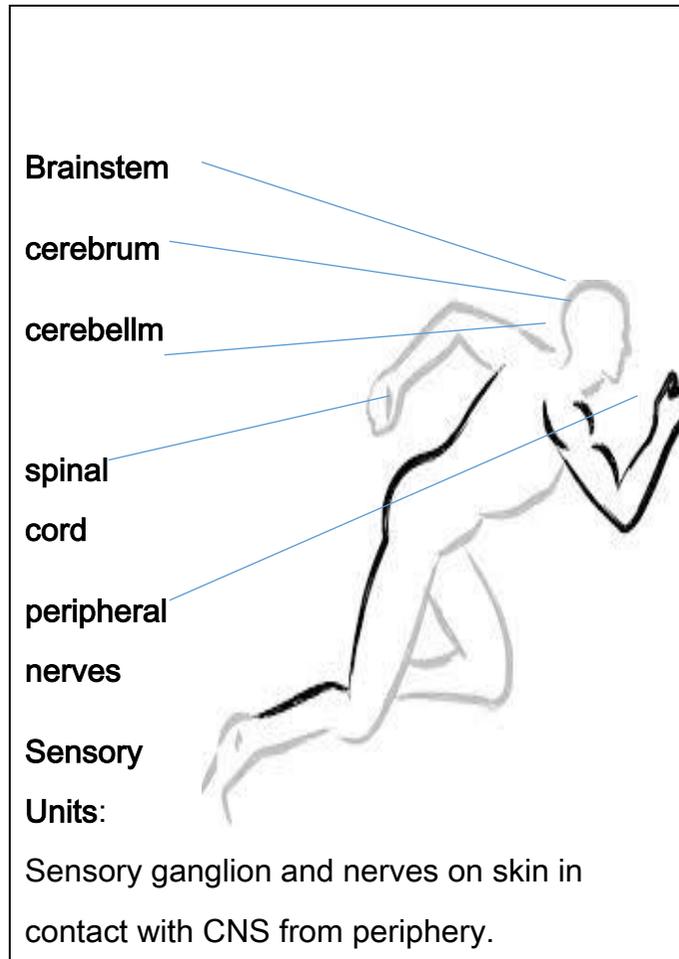
9.

***SPECIAL SENSES
THERAPY***

***OLFACTORY/
TACTILE/ TASTE
/AUDITORY***



SPECIALIZED SENSORY TECHNIQUES FOR NEUROMUSCULAR MASSAGE



OVERVIEW OF SPECIAL SENSE SYSTEMS INVOLVED IN THERAPY

Special sense therapies in neuroscience covers tactile, olfactory, gustatory, visual and auditory sense systems and targets therapy through them..

The nerve endings and variables involved in managing special senses therapy are specific. The neurological impact in olfactory systems, for instance, of an aroma oil on the limbic system and the human disposition, locally and generally are specific to organize arousal, or sedation, pleasure, or tonification have a vast location in therapeutics. There are other systems activated as lymphatics, immune building, anti-infective, warming (increases body temperature) in a direct or indirect plan of care.



10

***EMBRYONIC BODY
TYPES AND***

SPORTS THERAPY

In spa therapies the clients body type must be assessed according to predominant embryonic tissue and its characteristics. Types listed are Ectomorph, Endomorph and Mesomorph and described by the AMBP journal as

ECTOMORPH: linear, fragile, delicate, lean, and lightly muscled.

ENDOMORPH: spherical, round, soft-bodied, underdeveloped muscles, difficulty losing weight.

MESOMORPH: hard, rugged, triangular, athletic with well-developed muscles, thick skin, and good posture.

Clients' body types influence how they will respond to training and treatment. Kousaleos offers these guidelines for performing sports bodywork on each of the three somatotypes:

The ectomorphic structure (lean, endurance) needs more comfortable pressure with less specific depth. Because ectomorphs

typically have more neurological sensitivity,
the techniques and protocols should be
smoother and less deliberate.

11.

MAINTENANCE .

***NEW STANDARDS OF
THERAPEUTIC EXERCISE***



Therapists must orient therapy, assessment and aftercare to these goals through rigid enforcement and support for clients. Clients will essentially be based on exercise programs to re-educate and improve their condition.

It is necessary to devise tests, correction measures and therapeutic protocols to re-educate physical discipline.

Defining the "New" 6 goals of therapeutic exercise for maintenance and aftercare.

- 1- balance/postural control/stability**
- 2-coordination**
- 3-cardiopulmonary fitness**
- 4- mobility (flexibility)**
- 5- muscle performance**
- 6- relaxation**

The first "new" goal of therapeutic exercise, maintenance and aftercare, constitutes balance/postural control/ and stability







