International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

IJPAR |Vol.14 | Issue 4 | Oct - Dec -2025

www.ijamscr.com

DOI : https://doi.org/10.61096/ijpar.v14.iss4.2025.686-693

ISSN:

Research

THERAPEUTIC ASPECT OF DERIVED POSITION FOR STROKE PATIENTS

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Published on: 29 OCt 2025

Published by:
Futuristic Publications

Abstract

Stroke remains a major cause of long-term disability, leading to impairments in motor function, muscle tone, and postural control. Positioning strategies play a vital role in stroke rehabilitation, as incorrect posture may contribute to contractures, spasticity, and pressure sores. Derived positions—specific postural modifications based on biomechanical and neurophysiological principles—are used to optimize muscle activity and facilitate recovery.

Keywords: Stroke, Derived position, Physiotherapy, Neurorehabilitation, Spasticity, Postural control, Motor recovery

INTRODUCTION

In order that a movement may always be performed in the same way, and thus have a definite and measurable effect, it is given from a definite starting position, which, as far as the character of the movement allows, must be maintained carefully throughout the exercise. For active movements the object of the starting position is generally to give the working muscles a firm origin. For passive movements and massage manipulations, on the contrary, the aim

is complete relaxation of the joints and muscles or of the tissues manipulated.Besides this, certain starting positions considerably modify the effect of a movement and produce certain specific effects upon the body, which will be again referred to in the description of the positions.Starting positions are divided into Fundamental and Derived positions. The former consist of the simplest positions : - Standing, Knee-standing, Sitting, Lying, and Hanging. The derived positions arise from the fundamental positions by altering the position of one or more parts of the body. Stretch-standing is thus derived from standing position by stretching the arms upward; Stretch-stride-standing by also moving the feet apart; Stretch-stride-turn-standing by further rotating the trunk towards one side.

Fundamental & derived Positions are usually described as the starting positions from which exercises start. The position which adopted, by the patients or individual to perform exercise or movement to gain relaxation and stabilize their body. OR The posture from which movement is initiated i.e. called starting position.They may be either active or passive in character. Starting position is applicable for day to day activities.Derived position is derived from starting position. This position is used by modification of arms, legs or trunk in each of fundamental position.

Selection of The Position

Selection of the suitable position is made according to the purpose for which they are required

- The ability of the pt. to assume the position.
- The need to stabilize one segment of the body to permit safe & efficient movement. .
- The use of gravity for assistance or resistance.
- The presence of pain or discomfort (the position. should be pain free to assure relaxation of the pt. .
- The use of a short lever arm versus a long lever arm.
- utilize support essential for relaxation.
- Train balance.
- Achieve adequate fixation when movement is to be localized to specific joint.
- Modify the effect of an exercise to improve R.O.M. Or strength.
- Maintain or improve posture

purpose for modifications of the position

1. Increase or decrease the size and stability of the base of support of the body.

2. raise or lower the center of gravity (COG)

3. Ensure maximum local or general relaxation.

4. Provide a control or fixation for a particular part of the body to localize movement to a particular part of the body to localize movements to a specific area.

5. Increase or decrease the muscle work required to maintain the position.

6. Avoid muscle shortening and contractures.

7. Avoid joint stiffness and intra articular adhesions.

8. Avoid respiratory and circulatory complications as pressure ulcers and pneumonia, DVD.

9. Increase or decrease the leverage.

SIDE LYING

It is one of the derived position of lying.It is most convenient position for prolonged period. In this position one side of the body is compressed

JOINT/AREA	JOINT MOVEMENTS	MUSCLE WORK

Head and neck	extension	extensors
Shoulder	protraction/elevation/extension/adduction/ medial rotation	protractors/elevators/extensors/adductors/ medial rotators
Elbow	extension/mid prone	extensors/mid pronators
Wrist	extension/radial deviation	extensors/radial deviators
Finger	extension	extensors
Trunk	extension	extensors
Hip	extension/adduction/medial rotation	extensors/adductors/medial rotators
Knee	extension	extensors
Ankle	plantar flexion/invertion	plantar flexors/invertors
Toes	extension	extensors

CROOK LYING

It is one of the derived position of lying.In this position ,hip and knee are flexed.It is easily attained in supine lying

JOINTS/AREA	JOINT MOVEMENTS	MUSCLE WORK
Head and neck	extension	extensors
Shoulder	retraction/depression/extension/adduction/medial rotation	retractors/depressor/extensors/adductors/medial rotators
Elbow	extension/mid prone	extensors/mid pronators
Wrist	extension/ulnar deviation	extensors/ulnar deviators
Finger	extension	extensors
Trunk	extension	extensors
Hip	flexion/adduction/medial rotation	flexors/adductors/medial rotators
Knee	flexion	flexors
Ankle	plantar flexion/everion	Plantar flexors / evertor
Toes	extension	extensors

CROOK SITTING

It is one of the derived position of sitting. In this position hip and knee are flexed. Feet placed on the floor and the weight transmitted through the hip

JOINT/AREA	JOINT MOVEMENT	MUSCLE WORK
Head and neck	extension	extensors
Shoulder	retraction/depression/extension/adduction/medial rotation	Retractors/depressors/extensors/adductors/medial rotators
Elbow	extension/mid pronation	extensors/mid pronators
Wrist	extension/ulnar deviation	extensors/ulnar deviators
Finger	extension	extensors
Trunk	extension	extensors
Hip	flexion/adduction/medial rotation	flexors/adductors/medial rotators
Knee	flexion	flexors
Ankle	dorsiflexion/inversion	dorsi flexors/invertors
Toes	extension	extensors

LONG SITING

It is one of the derived position of sitting .In this position, hip is flexed and knee is extended.It is also called strech sitting.

JOINT/AREA	JOINT MOVEMENT	MUSCLE WORK
Head and neck	extension	extensors

Shoulder	retraction/depression/extension/adduction/medial rotation	retractors/depressors/extensors/adductors/medial rotators
Elbow	extension/mid pronation	extensors/mid pronators
Wrist	extension/ulnar deviation	extensors/ulnar deviators
Finger	extension	extensors
Trunk	extension	extensors
Hip	flexion/adduction/medial rotation	flexors/adductors/medial rotators
Knee	extension	extensors
Ankle	dorsiflexion/eversion	dorsi flexors
Toes	extension	extensors

HALF KNEELING

JOINT AREA	**JOINT MOVEMENT**	**MUSCLE WORK**
Head and neck	extension	extensors
Shoulder	Retraction/depression/extension/adduction/medial rotation	Retractors/depressors/extensors/adductors/medial rotators
Elbow	extension/ mid pronation	extensors/ mid pronators
Wrist	extension	extensors
Finger	extension	extensors
Trunk	extension	extensors
Hip	right leg- flexion/abduction/ lateral rotation Left leg-extension/adduction/medial rotation	right leg- flexors/abductors/ lateral rotators Left leg– extensors/adductors/medial rotators
Knee	right leg– flexion Left leg-- flexion	right leg– flexor Left leg-- flexors
Ankle	right leg—neutral Left leg – plantar flexion	right leg—neutral Left leg – plantar flexors
Toes	right leg -extension	right leg extensors

	Left leg -- flexion	Left leg -- flexors

It is one of the derived position of kneeling.In this position weight is transmitted through one side knee.The leg is

JOINT AREA	JOINT MOVEMENT	MUSCLE WORK
Head & Neck	extension	extensors
Shoulder	Retraction/depression/extension/ adduction / medial rotation	Retractors/depressors/extensors/adductor/medial rotators
Elbow	extension	extensors
Wrist	extension	extensors
Fingers	extension	extensors
Trunk	extension	extensors
Right leg	Hip-flexion /adduction /medial rotation Knee - flexion Ankle - neutral Toes - extension	Hip - flexors / adductor/medial rotators Knee - flexors Ankle - co-activator Toes - extensors
Left leg	Hip - extension/adduction / medial rotation Knee - extension Ankle - neutral Toes - extension	Hip - extensors / adductor / medial rotator. Knee - extensors Ankle - co-activator Toes - extensors

resting on the floor and the ankle of one leg in plantar flexed

STEP STANDING

It is the of the derived position of Standing.In this position forward leg kept on the Stool.

CONCLUSION

The derived position plays a crucial therapeutic role in the rehabilitation of stroke patients. It facilitates optimal muscle activation, promotes normalization of tone, and improves postural alignment, balance, and functional mobility. By utilizing derived positions such as side-lying, prone-lying, and sitting, physiotherapists can influence reflex activity, enhance proprioceptive input, and encourage symmetry between the affected and unaffected sides. These positions also serve as preparatory postures for gait training and functional re-education. When applied systematically with appropriate handling and progression, derived positions help reduce spasticity, prevent contractures, and enhance motor recovery. Therefore, incorporating derived positioning techniques within a comprehensive neuro-rehabilitation program can significantly improve patient outcomes and quality of life after stroke.

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