Developing Technique for Arm Movement Rehabilitation of Post Stroke Patient

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Background Of The Study

·Today Pandemic brought everything must be changed mainly on physically mobilization
However patient how undergoing rehabilitation usually depend on physiotherapy assistance and assistive tools or devices designed to assist the therapy which is often carried out by the physiotherapist

Objective Of Study

·Based on that condition an assistive tool for rehabilitation representative for live independently with motion exercises that support independent life has been considered.
•This paper focuses only on developing motion therapy exercises in post-stroke arm rehabilitation instead of traditionally therapeutic motion exercises.t

Methodology

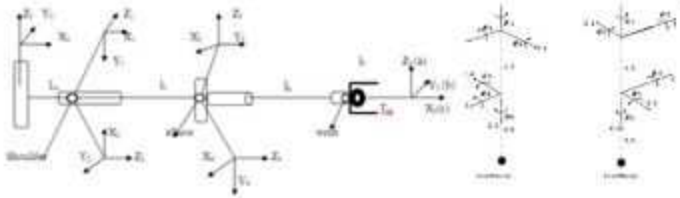
•This study examines and develops progressive movements to optimize the therapy result.
• An economical movement principle in assembling systems that is herbligh motion is applied to the therapy of arm stroke patient movements. [9], [10]
•The principle of this movement will be compared with the traditional motion therapy used by physiotherapists.
•Muscles strength is measured in positive passive and active muscles using EMGt

REACH, MOVE or TRANSPORT, RELEASE

Traditionally

Analysis

1. Kinematis Analysis



DH analysis
and mat lab simulation
•Kinematic simulation results show that high considerable joints should be joints 2 and 4 which perform upper arm movements that are supported by the Tricepsbrachii muscle when Therbligh movement of REACH.
•The second consideration is joints 3 and 4 which perform forearm movements that are supported mainly by Biceps brachii muscle when doing MOVE.
•The third consideration is joint 4 which perform forearm movements that are supported by Biceps brachii muscle when doing RELEASE.

2. BIOMECHANIC ANALYSIS

•Here, joint 4 performs the heaviest movement. The movement of joint 4 bears the load of all the arm's weight, thus extra power is needed to move this joint. It is almost impossible for stroke patients to bring out this extra force.
The arm's movement is in fact not only supported by the bones but also muscles. Therefore, the muscles' ability to help the arm's movement according to the Therblig movement standard should also be calculated and consideredAdd a little bit of body text

3. MEASUREMENTS BY EMG

•In this study the two principles movement Therblig and Traditional Method (Standard) were compared in 2 conditions; Relax and Contraction from the results of muscle measurements at the time before and after movements.
• Relax measurement conditions are condition where measurement are made when the muscles are in relaxed position. Whereas Contraction conditions where measurements are made when the muscles are in the contraction position.

EGM
measurements are made before and after the patients runs his motion therapy

Table 1. The Muscle Strength on Relax Position of Traditional Method (Standard) therapy movements

Respondent	Relax Position 1 (μVolt)		
	Before	After	Difference
1	35.0	37.6	6.6
2	81.3	87.7	8.4
3	78	83.2	5.2
4	99.8	107	7.2
5	69	74.3	5.3
6	77.8	79.2	1.4
Average			5.8

Table 2. The Muscle Strength on Relax Position of Proposed Method (Therbligh) therapy movements

Respondent	Relax position 2 (μVolt)		
	Before	After	Difference
1	35.0	40	5.4
2	107.3	112.5	5.2
3	77.2	85.2	8.1
4	99.9	111.8	11.9
5	59.4	56.8	6.6
6	76.2	86.7	10.5
Average			7.5

Table 3. The Muscle Strength on Contraction Position of Traditional Method (Standard) therapy movements

Respondent	Contraction position 1 (μVolt)		
	Before	After	Difference
1	238.4	324.6	94.2
2	329.2	380.1	50.9
3	424.9	473.9	49.0
4	365	453	88.0
5	71.8	93.9	2.1
6	101.8	222.8	30.9
Average			48.2

Table 4. The Muscle Strength on Contraction Position of Proposed Method (Therbligh) therapy movements

Respondent	Contraction position 2 (μVolt)		
	Before	After	Difference
1	300.2	318.1	11.9
2	337.9	362.7	24.9
3	444.5	522.2	77.7
4	389.6	488.9	99.3
5	78	85.3	7.3
6	387.7	259	51.3
Average			55.7

CONCLUSION

•Technique proposed can be used to help the rehabilitation of arms terapy and this technique meets the 3 criteria needed, that are independently, simplicity, and ability to stimulate the main muscles
•Measurements by EMG show the proposed has better chance