Flex Therapist CEUs

Stroke: Developments in Upper Extremity Devices

Hybrid Assistive Neuromuscular Dynamic Stimulation Therapy: A New Strategy for Improving Upper Extremity Function in Patients with Hemiparesis following Stroke

1. The most common impairment caused by stroke is:

A. Sensory disturbances including pain
B. Motor impairment
C. Understanding and using language
D. Thinking and memory impairments

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2. It is supposed that strong reliance on compensatory overuse of the intact upper extremity inhibits functional recovery of the impaired upper extremity, which may explain the limited improvement of the functional capability of the paretic upper extremity in activities of daily living.

A. True
B. False

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3. To participate in constraint-induced movement therapy, a patient must be able to voluntarily extend their fingers and wrist at least _____ degrees.

A. 10
B. 20
C. 30
D. 40

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4. All of the following have been reported as indications for hybrid assistive neuromuscular dynamic stimulation therapy, except for:

A. Cannot have cognitive deficits
B. Cannot have pain in the paretic upper extremity
C. Must have the ability to walk without physical assistance in daily life
D. Must have passive extension ROM greater than 20 degrees of the affected wrist and metacarpophalangeal joints

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5. It is necessary to restore finger extension to perform ADL with the paretic upper extremity in patients with severe to moderate hemiparesis.

A. True
B. False

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6. During finger extension, muscle activities of the _____ flexors are reduced with the wrist-hand splint.

A. Finger
B. Wrist
C. Elbow
D. During finger extension, muscle activities of the finger flexors, wrist flexors, and elbow flexors are all reduced with the wrist-hand splint

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7. Improvements of the Fugl-Meyer Assessment, the motor activity log 14, and the modified Ashworth scale lasted for _____ after the end of three weeks of hybrid assistive neuromuscular dynamic stimulation therapy.

A. 1 month
B. 2 months
C. 3 months
D. 6 months

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8. The aim of hybrid assistive neuromuscular dynamic stimulation therapy is to return the paretic hand to its original usefulness in ADL prior to the stroke.

A. True
B. False

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9. Functional recovery involves changes in neuronal excitability that alters the brain's representation of motor and sensory functions. The inhibitory neurotransmitter _____ is critical for cortical plasticity.

A. Dopamine
B. Glutamate
C. Gamma-aminobutyric acid
D. Acetylcholine

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10. A previous study showed all of the following correlations with short intracortical inhibition, except:

A. HANDS therapy prevented disinhibition of SICI in the affected hemisphere.
B. There was a direct correlation between the change of SICI in the affected hemisphere and the change of the Fugl-Meyer Assessment.
C. Patients who showed more disinhibition of SICI showed longer lasting improvement of motor impairment.
D. HANDS therapy strengthened disinhibition of the affected SICI.

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11. HANDS therapy was shown to improve the spasticity of:

A. The fingers
B. The fingers and wrist
C. The wrist and elbow
D. The fingers, wrist, and elbow

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12. HANDS therapy increased co-contraction of finger flexors during finger extension movement.

A. True
B. False

Development of portable elbow joint device for stroke patient rehabilitation

13. The elbow joint:

A. Is a synovial joint.
B. Functions as a hinge joint.
C. Is deemed a compound joint.
D. The elbow joint is a synovial joint that functions as a hinge joint and is deemed a compound joint.

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14. The orientation of the bones forming the elbow joint allows for flexion of _____ degrees of the forearm.

A. 180
B. 150
C. 120
D. 90

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15. All of the following describe a continuous passive motion machine or elbow joint rehabilitation device, except for:

A. It is an electrical, motor-driven device that helps support the injured limbs.
B. It is used to move a joint a variable rates through a progressively increasing range of motion.
C. Only moderate muscular exertion is required of the patient.
D. It acts to reduce blood and fluid accumulation in and around traumatized joints or that have undergone surgery.

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16. Patients indicate that using the portable elbow joint device did not make any physical strain due to its lightweight nature.

A. True
B. False

Feasibility and clinical experience of implementing a myoelectric upper limb orthosis in the rehabilitation of chronic stroke patients: A clinical case series report

17. Traditional rehabilitation does not restore normal motor control for all stroke survivors, and upwards of 50% live with persistent upper limb dysfunction.

A. True
B. False

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18. This study found that clinically important changes on a motor control performance measure were observed in individuals with chronic stroke who participated in group training after they were deemed plateaued with traditional OT services and were being discharged from standard care.

A. True
B. False

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19. The MyoPro allows the practice of all of the following important motor learning principles, except for:

A. Because of similarities with other motions, training with the device allowed for high muscle memory transfer to the specific training movements.
B. It encourages coordination, volitional muscle activation.
C. There is motivation for repeated practice which is encouraged by the reward of movement the device delivers.
D. The device allows for incremental progression of training.

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20. Delivery of care in a group setting allows more patients to benefit from limited rehabilitation resources and evidence suggests it can be as effective as individual therapy in stroke.

A. True
B. False

Home rehabilitation supported by a wearable soft-robotic device for improving hand function in older adults: A pilot randomized controlled trial

21. Because robot-assisted therapy needs little supervision by a healthcare professional and is highly efficient in transferring the trained movements into daily situations, it is the ideal stroke rehabilitation model.

A. True
B. False

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22. Robotic gloves can use _____ to provide assistance for the affected hand.

A. An EMG-controlled glove
B. A tendon driven glove
C. A glove controlled by force sensors
D. Robotic gloves can use an EMG-controlled glove, a tendon driven glove, or a glove controlled by force sensors to provide assistance for the affected hand

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23. For a person with reduced hand function, the assistive functionality of the ironHand system provides extra strength to the grip of all of the following, except:

A. Thumb
B. Index finger
C. Middle finger
D. Ring finger

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24. Which of the following is modulated by pressure sensors in the fingertips?

A. The extra grip strength
B. The grip support
C. Both the extra grip strength and the grip support
D. Neither the extra grip strength nor the grip support

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25. The therapeutic functionality of the ironHand system provides a motivating game-like environment to train all of the following specific aspects of hand function, except:

A. Hand / finger strength
B. Finger coordination
C. Finger range of motion
D. Finger independence

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26. What was assessed as the primary outcome measure in this study?

A. Maximal handgrip strength of the most-affected hand
B. Maximal pinch strength of the most-affected hand
C. Hand function performance of the most-affected hand
D. Finger independence of the most-affected hand

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27. Older adults that use the ironHand system as an assistive device or as a training tool are capable of using the ironHand system by themselves at home.

A. True
B. False

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28. Participants of the therapeutic group improved more from pre- to post-evaluations for _____ compared to the assistive and control groups.

A. Pinch strength
B. Handgrip strength
C. Functional performance
D. All of the above

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29. Improvements in functional performance in the technology-assisted groups were statistically significantly better than the improvements in the control group.

A. True
B. False

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30. In terms of application as a rehabilitation tool in the therapeutic group, improvements in _____ have been reported after robotic hand rehabilitation, applying mostly stationary and/or portable systems as training devices in clinical settings after stroke.

A. Pinch strength
B. Handgrip strength
C. Functional use of the arm / hand
D. All of the above

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31. There was no decline in strength and functional performance after using the assistive system.

A. True
B. False

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32. Which of the following is known as one of the essential elements for motor relearning after stroke?

A. Incremental progression
B. Functional practice
C. Muscle memory
D. Coordinated muscle activation

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33. Which of the following is the most powerful predictor of ADL disability?

A. The degree of the stroke.
B. The age of the patient.
C. Low amounts of exercise / physical activity.
D. Time spent on retraining.

Effect of a mixed reality-based intervention on arm, hand, and finger function on chronic stroke

34. Brain plasticity and behavior are interrelated in all of the following ways, except:

A. Behavior is a result of reorganized brain activity.
B. Adaptive neural reorganization is driven by skill-dependent experiences and behavior.
C. Reorganization is driven by mere repetition.
D. Reorganization only occurs when the experience implies learning.

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35. Which motor learning principle has proven to modulate the functional improvement after stroke?

A. Intensity
B. Repetition
C. Task-orientation
D. Intensity, repetition, task-orientation, and feedback have all proven to modulate the functional improvement after stroke

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36. Movement kinematics when reaching, grasping, transporting, and releasing objects in a virtual environment are comparable to those in the physical world, thus suggesting that the training of arm movements in Virtual Reality can be a feasible alternative.

A. True
B. False

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37. In individuals with stroke in either acute or chronic stages, Virtual Reality has been shown effective at improving upper limb movements for reaching and grasping tasks involving all of the following, except:

A. Distal fine motor control
B. Proximal segments
C. Global arm movements
D. VR has been shown effective at improving all of the above

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38. Controlled trials suggest that VR may be beneficial to improve upper limb function and performance in activities of daily living, but to a lesser extent than the same dosage of conventional therapy.

A. True
B. False

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39. Which scale has been shown to be more sensitive in the acute phase and for chronicity of less than six months?

A. Fugl-Meyer Assessment
B. Wolf Motor Function Test
C. Box and Block Test
D. Nine Hole Peg Test

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40. Which of the following has been reported as a major importance for motor rehabilitation and is known to positively affect arm-hand function recovery and motor control in stroke patients?

A. Exercises representing meaningful tasks specially designed to address functional activities.
B. The difficulty of the training.
C. Auditory augmentation of visual feedback.
D. Training that drives the subject's attention to the effect of the action.

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41. The mixed reality system is designed to train specific tasks that imply the use of the affected arm, hand, and fingers, with an explicit focus on strength and joint movement.

A. True
B. False

Arm rehabilitations in post stroke subjects: A randomized controlled trial on the efficacy of myoelectrically driven FES applied in a task-oriented approach

42. The MeCFES applied to forearm flexors during task-oriented activity leads to improved arm function at the neurological and activity level similar to that observed for usual care task-oriented therapy of the arm.

A. True
B. False

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43. At the post-assessment, the total score in the myoelectric control of functional electrical stimulation-task oriented training group indicated that from starting as a group with no arm-hand

capacity, they had ended at the borderline of:

A. No arm-hand capacity
B. Limited arm-hand capacity
C. Arm-hand capacity is present but takes abnormally long
D. Arm-hand capacity is normal

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44. The effective MeCFES treatment time was about 20 minutes.

A. True
B. False

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45. A large multicenter study saw no effect from NMES treatment of wrist and finger extension in a large group of subacute subjects that did not have at least _____ of voluntary wrist and finger extension against gravity.

A. 5%
B. 10%
C. 15%
D. 20%
