



Online Continuing Education Courses  
www.OnlineCE.com



AOTA Approved Provider #4023

**Course Title:** Stroke Rehab 137

**Course Subtitle:** Neurophysiology of Stroke Recovery

**Source:** Stroke Recovery and Rehabilitation, 2<sup>nd</sup> ed.

Source Description: The definitive core text in its field, *Stroke Recovery and Rehabilitation* is a comprehensive reference covering all aspects of stroke rehabilitation from neurophysiology of stroke through the latest treatments and interventions for functional recovery and restoration of mobility. This second edition is completely updated to reflect recent advances in scientific understanding of neural recovery and growing evidence for new clinical therapies.

The second edition provides in-depth information on the assessment and management of all acute and long-term stroke-related impairments and complications including cognitive dysfunctions, musculoskeletal pain, and psychological issues.

It examines risk factors, epidemiology, prevention, and neurophysiology as well as complementary and alternative therapies, functional assessments, care systems, ethical issues, and community and psychosocial reintegration.

With contributions from over 100 acknowledged leaders from every branch of the stroke recovery field, this edition features expanded coverage of key issues such as the role of robotics and virtual reality in rehabilitation. New chapters have been incorporated to cover fields of recent exploration including transcranial magnetic stimulation, biomarkers, and genetics of recovery as well as essentials like the use of medication and the survivor's perspective. The up-to-date presentation of scientific underpinnings and multi-specialty clinical perspectives from physical medicine and rehabilitation, neurology, physical therapy, occupational therapy, speech and language pathology, and nursing ensures that *Stroke Recovery and Rehabilitation* will continue to serve as an invaluable reference for every health care professional working to restore function and help stroke survivors achieve their maximum potential.

See course outline below for details and inclusive content in Stroke Rehab 137 course.

**Target Audience:** OT/OTA, PT/PTA and other healthcare professionals

**Course Length:** 4 hours

**Course Author/Instructor:** Joel Stein, MD / Brown, MS, OTR/L

**Educational Level:** Introductory, Intermediate, Advanced

## **Course Objectives:**

At the end of the course, participants will be able to:

- Describe various mechanisms and neurophysiology of recovery from stroke
- Describe how imaging is used in regard to stroke recovery
- Outline 3 changes to brain function in relation to recovery of behavior after stroke
- List and describe 3 anatomical biomarkers used as predictors of recovery after stroke
- Describe how genetics can influence stroke recovery
- Outline 3 other factors that influence recovery after stroke
- Become familiar with the physiological basis of rehabilitation in stroke
- Describe rehabilitation training techniques that target the central nervous system, spinal cord and skeletal muscle

## **Outline of Content:**

### **Hour #1**

#### **The Mechanisms and Neurophysiology of Recovery from Stroke**

##### ORGANIZATION OF MOTOR CORTEX IN PRIMATES

Primary motor cortex

Dorsal motor cortex

Ventral motor cortex

Supplemental motor area

##### DIFFERENTIAL PROCESSING STREAMS BETWEEN PARIETAL AND PREMOTOR CORTEX

Cingulate Motor Areas

Primary somatosensory cortex

##### EXPERIENCE-DEPENDENT PLASTICITY IN CEREBRAL CORTEX

PLASTICITY IN ADJACENT TISSUE AFTER FOCAL DAMAGE TO M1

FUNCTIONAL AND STRUCTURAL PLASTICITY IN REMOTE REGIONS AFTER FOCAL DAMAGE TO M1

ROLE OF BEHAVIOR IN MODULATING POSTINFARCT RECOVERY

#### **Functional Imaging and Stroke Recovery**

##### METHODS FOR EXAMING SPONTANEOUS BEHAVIORAL RECOVERY FOLLOWING STROKE

Animal studies

Human brain mapping

### **Hour #2**

##### CHANGES IN BRAIN FUNCTION IN RELATION TO RECOVERY OF BEHAVIOR AFTER STROKE

Increased activation across a network

Diaschisis

Reduced activation in the injured zone

Displacement of function and representational maps

Changes in peri-infarct activity  
Changes in interhemispheric laterality  
THERAPEUTIC INTERVENTION AND RECOVERY  
Brain mapping to guide poststroke therapy  
Brain mapping to predict treatment responses and outcomes  
Functional imaging of treatment-induced recovery  
Motor learning and plasticity  
EMERGING CONNECTIVITY METHODS TO STUDY CORTICAL FUNCTION  
DURING STROKE RECOVERY  
FUTURE STUDIES

### **Anatomical and Physiological Predictors of Recovery**

#### GOALS OF BIOMARKER RESEARCH

Idea of prediction  
Correlation with recovery  
Motor focus  
The ideal biomarker in stroke recovery

### **Hour #3**

#### ANATOMICAL MARKERS

Lesion volume/location  
Focus on the corticospinal tract  
Fractional anisotropy as a measure of white-matter integrity  
Tractography

#### PHYSIOLOGICAL MARKERS IN MOTOR RECOVERY

Transcranial magnetic stimulation  
EEG/MER  
PET/fMRI  
Near infrared spectroscopy  
Motor synergies/EMG/Kinesiological markers

#### NONMOTOR FUNCTIONS

Aphasia  
CONCLUSIONS

### **Genetics of Stroke Recovery**

FORMS OF GENETIC VARIATION  
GENETICS OF NEURAL PLASTICITY AND RECOVERY  
IDENTIFICATION OF NEW GENETIC VARIANTS  
RELEVANCE OF GENETIC POLYMORPHISMS  
OTHER FACTORS THAT INFLUENCE RECOVERY

Depression  
Stress  
Cerebral Blood Flow  
Plasticity  
CONCLUSION

#### **Hour #4**

##### **Physiological Basis of Rehabilitation Therapeutics in Stroke**

Rehabilitation Training Techniques Targeting CNS

Other interventions supporting CNS plasticity

SPINAL CORD

Rehabilitation Training Techniques Targeting Spinal Cord

SKELETAL MUSCLE

Rehabilitation training techniques targeting muscle

SUMMARY

##### **Medications and Stroke Recovery**

CONCEPTS AND MECHANISMS

PRECLINICAL PHARMACOLOGY

Noradrenergic agents

Antihypertensives

Major tranquilizers and related drugs

Antidepressants

Anxiolytics

Anticonvulsants

Possible Mechanisms of Neurotransmitter-Modulated Recovery

Pharmacological Effects on Poststroke Recovery in Humans

Recovery from Aphasia

Impairment of recovery

CONCLUSION

##### **Instructional Methods and Formats:**

Online course available 24/7 at [www.OnlineCE.com](http://www.OnlineCE.com) includes PDF downloadable course.

See course formats for additional details.

##### **Course Completion Requirements:**

A minimum passing score of 100% is required for course completion. You will have as many attempts as needed until your passing score of 100% is achieved. Upon successful completion of course, you will receive your certificate of completion and AOTA eligible CEUs.

##### **AOTA Classification Codes:**

Category 1: Domain of OT

Category 2: Occupational Therapy Process

Category 3: Professional Issues

##### **Additional Policies:**

OnlineCE Policies are available by clicking on the tab – Policies – located in the left-hand navigation bar.

*OnlineCE.com is an AOTA Approved Provider of continuing education. AOTA does not endorse specific course content, products, or clinical procedures.*