A Healing Art: The Yin and Yang of Dance and Neurorehabilitation

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Evolution of My Study of Movement

Current

http://www.ludovicflorent.fr/actu/
Overview

Introduction
• Goals
• Key concepts

Why dance as therapeutic tool?
• Healing components of Dance
• Dance as a healing art

How can Dance help Science?
• Movement and Memory
• Physical Activity and Mood

Summary
• Review of the main goals
• Bridging the gap
Injury Prevention

Research Tools

Dance as a Healing Art
Can Dance Help Neurorehabilitation?
What Do You See?
Therapeutic Components of Dance

- Problem Solving
- Activation of Multiple Senses
- Non-Verbal Communication
- Emotion
- Motivation
- Physical Contact
Can dance improve function in individuals with Alzheimer's Disease?
Manifestations of Alzheimer's disease

- Memory Loss
- Social Withdraw
- Irritability
- Sleep Disturbances
- Executive Function Deficits
- Distrust in others
- Aggression

- Disorientation
- Lack of Spatial Relationships
- Executive Function Deficits
Principle I: Physical Activity and Mood

• A few hypotheses:
  • Thermogenic
  • Monoamine
  • Increase blood flow enhances metabolism
  • Endorphins and Endocannabinoids
The brain’s ability to reorganize itself by forming new neural connections.

Source: http://renewyourmind.co.nz/retrain-brain-neuroplasticity-in-action/


Principle II: Functional Magnetic Resonance Imaging

Healthy Controls

Individuals with Injuries

Difference

Plan and execute movements and sense of touch

Sense of touch, left auditory processing

Sense of touch, planning and execution of left side

Sharp et al. (in progress)
Principle III: Dance and Alzheimer's disease

Hokkanen L, et al. 2008
So far.....

• The brain has the ability to reorganize
• Dance has many therapeutic components
• Relationship between activity and mood
• Previous studies demonstrate improvements in motor function and quality of life in patients with neurological disorders.
Key Components of Dance

- Sequencing
- Timing
- Spatial Relationship
- Relevancy to the Past Experience
- Can apply Principles of Motor learning and planning
- Physical Activity
- Task Specificity

Practice

1. Create 15 sec phrase
2. Incorporating at least 3 of the key components of dance
3. Specific Setting

A PHRASE: Sequence of movements
Our Basic Implementation Strategy

Population

Dance
Motion Capture Data + Muscle Activation Patterns
Therapeutic Effects of Dance

Outcome Measures

- Neuroplasticity
  - fMRI
  - EEG

- Cognition
  - Mini Mental State Exam

- Depression
  - Beck’s Scale

- Movement Analysis
  - Motion Capture
  - Force Plates
Integration of Various Art Forms

Musicians

Choreographers and Dancers

Visual Artists

Dance as a therapeutic tool
Dance Can be a Valuable Tool for Neurorehabilitation

- Increase spatial Awareness
- Brain reorganization
- Cognition
- Depression

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- Increase in independence
- Increase in quality of life
What Do You See NOW?
Overall Summary

- Dance has many therapeutic components
- Dance can help patients with neurological disorders
- Integration and synergies crucial for advancement
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