Physical Therapy
CRPS and Chronic Pain

Julie Bergmann, PT, OCS
Southern California Aquatic and Physical Therapy
Huntington Beach, CA
Focus on Therapeutic Interventions

- Brain Retraining
- Laterality Training
- Explicit Motor Imagery
- Mirror Therapy

Aquatic Physical Therapy
I have no financial interest in any of the products or companies represented in this presentation.

Copyright 2016, no part of this presentation may be reproduced or transmitted in any form by any means without written permission of the author.
Where does Pain come from?

TRUE OR FALSE

- Pain only occurs when you are injured
- The Brain decides when you experience pain
- Chronic Pain means an injury hasn’t healed properly
- In chronic pain and CRPS, chemicals associated with increased stress can directly activate nerves sensitivity

PAIN IS REAL
Brain Creates Pain

- Warning system, protection mechanism
- What is Phantom Limb Pain?
- Context: what you believe, where you are, what you think, what you understand
- Pain may increase with thoughts of pain anticipation: “I know I am going to have pain when...I get out of bed...when I walk...”
Homunculus “Little Man”
Motor and Sensory Cortex: Brain Map
The Brain’s Image of Painful Body Part

- Smudging: image of your affected limb is not as defined in the sensory or motor area of brain, can lead to spreading of CRPS

- “The hand”, “the foot”, giving body part a name separate from own
Brain Retraining for CRPS

- Treatment focused on training the brain to reconnect to the body part affected by pain
- Goal is to activate your brain to RECONSTRUCT the body part without increasing activation of severe pain state
- BRAIN IS PLASTIC
What is graded motor imagery?

Graded Motor Imagery is the most up to date rehabilitation program – based on the latest science and clinical trials to treat many complex pain, and movement problems.

The three stages of G.M.I

Graded motor imagery is broken down into three unique stages of treatment techniques, each exercising your brain in different ways.
Phase 1  Left/Right Discrimination Laterality Training

- Ability to identify a body part as right or left

- Goal: Reconstruct a clear representation of left and right body part affected
Choose your test

- Feet
  - Vanilla Feet
- Feet
  - Context Feet
- Feet
  - Abstract Feet

Neuro Orthopaedic Institute

www.noigroup.com

Other apps from noigroup
Laterality Recognise NOI Group

- Frequency: 3-5 times per day
- Duration: 20-50 images per session for minimum two weeks
- Goal: 85% accuracy both right/left <2 seconds
- APP: Apple and Android, many different body type images
- If Pain – decrease images/frequency/challenge
Phase 2  Motor Imagery

- Watching or imagining a body part in a certain position or motion
- Watch another person’s body part in a magazine or out in public
- Imagine yourself moving doing a certain movement, sport, walking
- Look at pictures of the body in magazines, differentiate right from left
Motor Imagery

- Frequency: 3-5 times per day
- Begin with 3 minutes, increase to 10 minutes
- Minimum two weeks
- Pain increase – decrease time/frequency or go back to Laterality training
Phase 3  Mirror Therapy

- Use of a mirror to present a reverse image to the brain
- Goal is to Reconstruct a more clear representation of body part in the brain
- No jewelry, limb should be the same as the other side
- TRICK YOUR BRAIN!
Mirror Therapy

- Look at an image of the body part in the mirror first – start with picture
- Look at mirrored body part – no movement
- Look at mirrored body part moving
- Introduce tools, pens, objects like lifting cups that affected limb used to be able to do
- Can use the mirror in different places to provide the brain with different contexts, with music on, add different smells and noises
Mirror Therapy
Mirror Therapy

- Frequency: 3-5 times per day
- Duration: 1-10 minutes
- Minimum two weeks
- If Pain: decrease frequency/duration or go back to Phase 1 or 2
Brain Retraining takes constant effort!
Aquatic Therapy
The Bridge to Land
"Believe me, it's overrated up here."
What is the difference between Aquatic Physical Therapy and Aquatic Exercise?

Aquatic Physical Therapy requires the “skilled service of a PT and/or PTA” (aquaticcpt.org)

Covered by insurance: check your plan!

CPT Code 97113

Aquatic Exercise is the utilization of water for the implementation of quality of life, fitness-related or general health-related goals. (aquaticcpt.org)
Does Water Temperature Matter?

- **Therapeutic Temperature**: 88-94 degrees
- **Benefit**: decreased muscle guarding, relaxation, less pain

- **Commercial Pools**: 78-85, moderate to high activity level

- **Spa Temperature**: Typically 100-104 degrees
What are the Benefits of Aquatic Physical Therapy?
Buoyancy

- Supports body, reduces stress, promotes flexibility and range of motion, joint decompression
- Promotes relaxation, greater ease of movement
- Reduces stress on entire nervous system
Graded Weight Bearing

Begin walking and weight bearing when unable to on land, recovery is faster

Balance activities, functional activities, weight shifting
Gentle Graded Resistance

- Able to progress at individual challenge level
- Core Stabilization, Proprioception, Posture
- Able to progress slowly without increasing pain
Graded Resistance
Body Conditioning

- Improved heart, lung function and circulation – assists with decreasing swelling from hydrostatic pressure
- More oxygen to the body promotes healing
- More oxygen to the brain helps with stress and brain retraining

Healthy Heart

Healthy You
Types of Aquatic Exercise Equipment

Buoyant/Supportive

Resistive
Psychological Benefit
Freedom to Move Without Fear
Aquatic Therapy Promotes Better Sleep!
Aquatic Physical Therapy Program Components
Gentle Stretching

- Hold 20-30 seconds
- Repeat 3-5 times
- Practice Relaxation Breathing during hold
- No PAIN
- Can use equipment to assist
Shallow Water 3-5 feet

- Walking, forwards, backwards, side to side
- Balance/Proprioception Activities
- Core Stabilization
- Functional Training
Functional Activities: Steps
Functional Squat
Functional Squat with Theraband
Core Stabilization and Balance
Deep Water: Weightless!

- Hanging/Decompression of Body/Relaxation
- Conditioning, Running, Cross Country, Biking
- Simulate land activities: brain retraining
- Strengthening, Stretching
- Use buoyancy equipment
- Use resistive equipment with buoyancy equipment
Deep Water Conditioning/ROM
Deep Water Conditioning
Aquatic Exercise Guidelines

- Pacing Exercise: Less is More
- Take frequent breaks between exercises: rest and breathe deeply, visualization
- Progress exercise time slowly over several weeks
- Drink plenty of water
- Rest when you get home
- Practice good nutrition and sleep habits
Borg Scale: Rate of Perceived Exertion: Scale 0-10/10, rate how hard you are working during activity

Track Exertion Level to find proper exercise intensity to not aggravate nervous system
<table>
<thead>
<tr>
<th></th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Very Very Hard Activity</td>
</tr>
<tr>
<td></td>
<td>Completely out of breath, unable to talk</td>
</tr>
<tr>
<td>9</td>
<td>Very Hard Activity</td>
</tr>
<tr>
<td></td>
<td>Can speak only one word at a time</td>
</tr>
<tr>
<td>7-8</td>
<td>Hard Activity</td>
</tr>
<tr>
<td></td>
<td>Out of breath, can speak a sentence or two</td>
</tr>
<tr>
<td>4-6</td>
<td>Moderate Activity</td>
</tr>
<tr>
<td></td>
<td>Can still carry a conversation</td>
</tr>
<tr>
<td>2-3</td>
<td>Light Activity</td>
</tr>
<tr>
<td></td>
<td>Breathing is easy</td>
</tr>
<tr>
<td>1</td>
<td>No Activity</td>
</tr>
</tbody>
</table>
General Activity Monitoring

- Fitness Monitor/APP, daily step monitoring
- Monitor HR, check exercise intensity
- Diary of fatigue level, comfort level 0-10/10
- Problem solving around your environment

GOAL: Decrease sensitivity of the nervous system, create healthier body and mind
How to Succeed with Your Rehabilitation

- Be a part of your solution
- Ask questions
- Give information to your PT
- Must be compliant with the whole program

- Ask support system for help, find an advocate
Brain Retraining/Education Resources

- Recognise APP, GMI, Mirror Therapy: NOI Group
- Protectometer, GL Mosely, David Butler
- Explain Pain, GL Mosely, David Butler
- The Brain That Changes Itself, Norman Doidge, MD
- Phantoms in the Brain, VS Ramachandran, MD
- Why Does Everything Hurt?, Adriaan Louw
- ISPI, International Spine and Pain Institute
Aquatic Resources

- Aquatic Section American Physical Therapy Association: aquaticcpt.org
- Aquatic Exercise Association: aeawave.org
- Aquatic Therapy and Rehab Institute: atri.org
- Wet Wrap: DK Douglas Company
dkdouglas.com
- Sprint Aquatics Equipment: sprintaquatics.com
- Millennial Pro Crutches: millennialmedical.com
Questions?

Southern California Aquatic and Physical Therapy

www.socalaquatictherapy.com
julie@socalaquatictherapy.com
Pool Demonstration 10 am