Webinar description

Cognitive rehabilitation for TBI/Stroke victims may include computerized therapies provided under the guidance of a trained clinician to support the improvement of cognitive deficits in attention, memory, executive functions and visual field.

RehaCom is a computerized cognitive therapy tool that provides deficit-specific therapies focused on the rehabilitation of patients with cognitive impairment.

This webinar will describe RehaCom and the evidence for use in the cognitive rehabilitation of patients with TBI/stroke.

We will begin by reviewing CVA and TBI after a brief review of the webinar last week.
Cognitive Rehabilitation

This is what was covered in Part I:

- What is Cognition?
- What is a Cognitive Deficit?
- What can be done to improve the functioning of individuals who have a Cognitive deficit?
- What components should be treated?
- What are the characteristics of Cognitive Rehabilitation?
- Is that the same thing as Cognitive Training or Brain Games?
- Is there any way modern technology can be incorporated into new techniques for Cognitive Rehabilitation?

Cognition: “The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses.”

Cognitive Rehabilitation

Basics of Cognition

Encompasses:
- Knowledge
- Attention
- Memory
- Judgment
- Reasoning
- Comprehension
- Language

Human Cognition is:
- Conscious
- Unconscious
- Concrete
- Abstract
- Intuitive

Cognitive processes use existing knowledge and generate new knowledge

What are some of the causes of Cognitive Deficits?

- Are they durable or temporary?
- Are they severe or mild?
- Are they serious?
- Are they pervasive?
- Do they require treatment?
- Will these deficits persist?
Cognitive Rehabilitation
Cognitive Deficits from Brain Trauma

- Attention
- Sustained Attention
- Selective Attention
- Divided Attention
- Change of Focus
- Hemineglect

- Memory
- Long-Term Memory
- Working Memory
- Phonological Loop

- Reasoning
- Planning
- Inhibition
- Motivation
- Mood
- Empathy

- Size, Shape
- Position, Orientation
- Angles, Volumes
- Depth Perception
- 2D / 3D Rotation

- Mental Imagery
- Background Separation

CVA & TBI: Two of the most disabling conditions

Cerebro-Vascular Accident or Stroke

- How is a CVA defined?
- What are the symptoms?
- What are the consequences of a CVA?
**CVA: What is a stroke?**

A stroke is a cerebro-vascular accident (CVA). It is in the head, and is caused by a blockage or rupture of the blood vessels carrying blood and oxygen, so the brain is deprived of oxygen. We call that hypoxia if it is brief, and anoxia if there is a total loss of oxygen.

A stroke occurs when a blood vessel that carries oxygen and nutrients to the brain is either blocked by a clot or bursts (or ruptures). When that happens part of the brain cannot get the blood (and oxygen) it needs, so it and brain cells die.

Stroke is a disease that affects the arteries leading to and within the brain. It is the No. 5 cause of death and a leading cause of disability in the United States.

**Long-term Effect of Stroke - Follow-up after 90 Days**

- Died: 14.7%
- Heavy impairments: 18.6%
- Moderate impairments: 9.4%
- 57.2%

**Types of Stroke?**

**What are the types of stroke?**

Stroke can be caused either by a clot obstructing the flow of blood to the brain (called an ischemic stroke) or by a blood vessel rupturing and preventing blood flow to the brain (called a hemorrhagic stroke).

A TIA (transient ischemic attack), or "mini stroke", is caused by a temporary clot.

**What would cause a person to have a stroke?**

- Atherosclerosis—narrowing and hardening of the arteries
- High Blood Pressure
- Nicotine
- Heart Disease
- Diabetes
- Excess Weight
- Some Medications
- Age
Symptoms of Stroke?

• You should consider these symptoms warning signs and consult a healthcare provider if there is:
  • Sudden weakness or numbness in the face, arm, or leg on one side of the body.
  • Abrupt loss of vision, strength, coordination, sensation, speech, or the ability to understand speech. These symptoms may become worse over time.
  • Sudden dimness of vision, especially in one eye.
  • Sudden loss of balance, possibly accompanied by vomiting, nausea, fever, hiccups, or trouble with swallowing.
  • Sudden and severe headache with no other cause followed rapidly by loss of consciousness – indications of a stroke due to bleeding.
  • Brief loss of consciousness.
  • Unexplained dizziness or sudden falls.

Neuropsychological Effects of Stroke?

• Weakness or numbness on one side of the body
• Loss of vision - inability to see the whole picture...hemianopsia
• Inability to formulate or comprehend speech
• Loss of balance
• Loss of consciousness (LOC)
• Loss of sensation...to the mouth, arms, hands, wrists...inability to execute commands such as 'Make a fist,' or show how to open a door...
• If damage is to a circumscribed area, such as the fusiform gyrus, the effects are narrower, i.e. impaired face recognition.

Traumatic Brain Injury:

Damage to the Brain from:
  • Bruising
  • Hemorrhage
  • Stretching
  
Usually “Global”

"Contre-Coup" Injury
Opposite the Area of Impact

"The sudden damage or death of brain cells due to a violent blow or jolt to the head OR by an object penetrating the skull"

Leading Cause of Death in Adults <45 yrs, and in Children 1 – 15 yrs
Common Patient Symptoms

- Decrease in intellectual functioning
- Slowed processing speed
- Memory loss/Forgetfulness
- Difficulty with language (e.g., word retrieval, comprehension)
- Speech
- Emotional changes (e.g., frustration, depression, impulsivity)
- Changes in insight
- Attention and Concentration changes (e.g., Easily distracted)
- Difficulty with planning and/or multitasking

Characteristics of Brain Injury: Physical

- Paralysis (quadriplegia) or weakness (quadruparesis) in both the arms and legs
- Paralysis (hemiplegia) or weakness (hemiparesis) on one side of the body
- Impaired fine motor skills, sometimes with tremors
- Poor overall body coordination (ataxia)
- Double vision (diplopia)
- Visual field cuts
- Motor speech disorders like dysarthria and difficulties in oral speech planning (oral apraxia)
- Inability to carry out learned movements (apraxia)
Characteristics of Brain Injury: Cognitive

- Impaired attention and concentration
- Memory impairment for learning and recall of new information
- Impaired problem-solving and decision-making skills
- Slowed information processing speed
- Impulsive thinking without regard for consequences
- Poor organization, planning, and sequencing abilities
- Impaired concept formation and abstract thinking
- Inflexible thinking and mental rigidity
- Poor judgment, especially in social situations

Characteristics of Brain Injury: Behavioral

- Inability to engage in purposeful activity
- Disinhibition
- Inability to respond appropriately to environmental cues
- Socially inappropriate behavior
- Social skills deficits
- Impulsivity
- Poor initiation and apathy
- Lack of insight into behavior and its consequences
- Inability to profit from experience
- Denial of deficits
- Poor self-esteem

Is there any hope for improvement? What can the patient and the family expect?
Cognitive Rehabilitation
Restoring Cognitive Function

Restitution
Re-establishing / Strengthening Damaged Neural Pathways

Reorganization
Developing Strengthening NEW Neural Pathways

Compensation
New Strategies / External Aids

How does computer assisted Rehabilitation differ from Brain Games?

Goals of Cognitive Rehabilitation

- Enhance capacity to process and interpret information
- Improve ability to function in all aspects of family and community life

Cognitive Rehabilitation Intervention Characteristics

- Structured
- Systematic
- Goal-Directed
- Individualized
- Repetitive
- Involve learning, practice, social contact, and relevant context
Computer-assisted Cognitive Rehabilitation

Computer Assisted Cognitive Rehab:
- Mild Deficits
- Moderate Deficits
- Severe Deficits

"BrainTraining" is NOT Cognitive Rehab and Computer Games are NOT Cognitive Rehab

Computerized Cognitive Training (CCT) or Computer Assisted Rehabilitation

- Computerized Cognitive Training
- Client and Patient Populations
- Clinician Mediation
- Development and Distinctive Features
- Screening Modules
- Training Modules
  - Attention, Memory, Executive Function, Visual Field
- Therapy Results
- Research
- Operating RehaCom
- Summary and Conclusion

RehaCom for TBI/Stroke Rehabilitation
Peter Entwistle, PhD, HSSP & Anne-Marie Kimbell, PhD, MSEd
March 28, 2018
Computerized Cognitive Training (CCT)

- Four (4) key areas of training:
  - Visual Field
  - Attention
  - Memory
  - Executive Function
- 20+ configurable training modules
- Continuously auto-adaptive to the training level of the patient
- Includes low training levels for those with severe cognitive deficits

Client and Patient Populations

Who is RehaCom used with?
- Patients with cognitive deficits resulting from:
  - Degenerative neurological disorders
  - TBI
  - Stroke
  - Other clinical conditions impacting cognitive functioning
- Deficits range from mild to severe
- Restorative or compensatory training
- Clients work in clinic/hospital setting often within a rehabilitation center

Who delivers RehaCom?
- The program is clinician mediated
  - It can only be accessed through engagement with a clinician
Clinician Mediation

RehaCom is clinician mediated.

Why does this matter?

Fidelity
Relationship
Integral
Efficiency
Accessibility

Those with diagnosable disorders tend not to finish self-administered programs.

The therapeutic alliance clinicians have with patients is very important to facilitate engagement with computerized cognitive training.
Computerized cognitive training in the context of more severe disorders is rarely seen as a stand alone treatment. Clinical expertise and oversight is needed to manage the process.

RehaCom extends the reach of clinicians by automating some elements of treatment and thereby creating greater efficiency and efficacy.

More time and opportunity become available for the complicated and critical aspects of overall treatment management.
Disorders like TBI, stroke, ABI require a more comprehensive approach to treatment which often includes:

- Physical Therapy
- Occupational Therapy
- Psychiatric Treatment
- Speech Therapy

Treatment requires a comprehensive approach therefore, a variety of clinicians may be the mediator.

- Occupational Therapist
- Speech/Language Therapist
- Psychologist
- Neuro-psychologist
- Physiatrist
- Physical Therapist
- Physician
- Other clinical staff

Development and Distinctive Features
Development and Distinctive Features
RehaCom is clinician-developed.
Why does this matter?

Relevance
Updated and revised based upon clinical use and feedback which is reflected in a range of training areas, breadth of training, and its configurability.

Training
RehaCom offers a distinctively broad range of training areas including attention, memory, executive functioning, and visual scanning.

Breadth
Levels vary from lower levels of challenge, for more severely impaired patients, to rather difficult levels for those with milder problems.

Configurability

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Training Breadth

While some sequences of training are typical, configurability offers clinicians an opportunity to refine their treatment through prioritizing areas of treatment and shifting levels of challenge.

Development and Distinctive Features

RehaCom is clinician-developed. Why does this matter?

Relevance

Training

Screening

Semi-Automation

Reporting

RehaCom provides an initial baseline and reference points for training with nine screening modules or tests.

The program adjusts according to an algorithm providing semi-autonomous training including live feedback. Training can be modulated by the clinician as well.

Performance report including graphs and numeric data can be generated. It can be exported, printed, and entered into the medical record.

Distinctive Features of RehaCom

Screening, Semi-Automation, and Reporting

RehaCom is individualized to the patient.

Auto-adaptation makes training more effective and easier to tolerate for the patient.

Clinician decides where to start training.

Flexible platform gives clinicians a range of options.

Helps clinicians do their jobs more effectively and efficiently.

Development and Distinctive Features

RehaCom is auto-adaptive.

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Development and Distinctive Features

Distinctive Features of RehaCom

RehaCom meets the patient at their level.

- Low levels of training allow those with severe deficits to train in a comfort zone
- The highest levels of training are very challenging
- This gives patients a broad range of rehabilitation
- Try the top levels yourself!

Distinctive Features of RehaCom

RehaCom keyboard is uniquely designed.

- This keyboard makes the program accessible for a broader range of patients
- The large buttons allow the patient to select or steer, and two large "OK" buttons are used to confirm the patient's decisions

Distinctive Features of RehaCom

Screening and Training

- Screening is a good place to start
  - Identify deficits
  - Guide treatment
- Training is flexible
  - Start with almost any module
  - Patients may need foundation training
  - Allows clinicians to approach training as they see fit
Development and Distinctive Features

Distinctive Features of RehaCom

• 20+ Training Modules
  – Same principles and structure applied to all modules
    – Makes training faster and more intuitive

Screening and Training

Screening Modules

• Screening modules identify deficits compared to age and gender based norms.

Attention and Concentration is often a good place to start due to the pervasiveness of attention deficits across disorders.
Screening Modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alertness</td>
<td>Tonic and phasic alertness.</td>
</tr>
<tr>
<td>Selective Attention</td>
<td>Reacting appropriately under time pressure &amp; simultaneously controlling impulsivity.</td>
</tr>
<tr>
<td>Divided Attention</td>
<td>Divided visual &amp; auditory attention with simultaneously presented stimuli.</td>
</tr>
<tr>
<td>Spatial Number Search</td>
<td>Basal cognitive performance, selective attention &amp; visual scanning. Can test visual neglect.</td>
</tr>
<tr>
<td>Memory for Words</td>
<td>Verbal learning ability according to the paradigm of the recurring figures. Read and store real words which are difficult to visualize.</td>
</tr>
<tr>
<td>Working Memory</td>
<td>Verbal learning ability according to the paradigm of the recurring figures. Read and store real words which are difficult to visualize.</td>
</tr>
<tr>
<td>Logical Reasoning</td>
<td>Ability to identify regularities, to continue a series, and draw logical conclusions (examines the ability to complete logical sequences).</td>
</tr>
<tr>
<td>Visual Field</td>
<td>Measures visual field, fixation accuracy &amp; sustained attention.</td>
</tr>
<tr>
<td>Visual Scanning</td>
<td>Measures performance in exploring visual field. Two parameters are measured: parallel search (at a glance) and serial search (in a structured way).</td>
</tr>
</tbody>
</table>

Screening Results

Graphical Representation
- Statistics: T-scores norms, Z-scores norms, and percentile ranks are shown across the top.
- Gray Bars: Patient's Results
- Longer bars denote larger deviations from norms.
- Background Colors (Green, Yellow, Red): Indicate extent of deficit. Red = more than 3 standard deviations below norm.
- Average performance of a sample group of healthy people.

Training Modules
- Attention
- Memory
- Executive Functions
- Visual Field
Ten (10) training modules are dedicated to **Attention**, a pervasive deficit in stroke, TBI, and other disorders.

**Attention Therapy with CCT**

Patients Seldom Complain of “Attention” Problems

- Common Patient Complaints – Memory, Fatigue, Confusion
- Patient may be blamed for “letting themselves go”, lack of readiness or effort (additional psychological stress)
- Attempts to Compensate Leads to “Overload”
- “Minor” Disturbances are difficult to Notice or Diagnose

Attention Screening is Recommended for ALL Cognitive Rehab Patients

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“A therapy, which puts too complex requirements on the impaired attention functions or doesn’t differentiate sufficiently between the attention functions, can lead to an aggravation of the attention performance.”

Attention Screening is Recommended for ALL Cognitive Rehab Patients!
Selective attention             Sustained attention        Alternating attention

JOURNAL OF NEUROTHERAPY

Attention Therapy with CCT
Attention Areas of the Brain

Training Modules
Ten (10) Attention and Concentration Modules

<table>
<thead>
<tr>
<th>Modules</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alertness</td>
<td>16</td>
</tr>
<tr>
<td>Reaction Behavior</td>
<td>16</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>20</td>
</tr>
<tr>
<td>Vigilance</td>
<td>15</td>
</tr>
<tr>
<td>Selective Attention</td>
<td>24</td>
</tr>
<tr>
<td>Attention &amp; Concentration</td>
<td></td>
</tr>
<tr>
<td>Visual Spatial Attention</td>
<td>24</td>
</tr>
<tr>
<td>2D Operations</td>
<td></td>
</tr>
<tr>
<td>3D Operations</td>
<td></td>
</tr>
<tr>
<td>Visual-Spatial Attention</td>
<td>24</td>
</tr>
<tr>
<td>Spatial Operations</td>
<td>42</td>
</tr>
<tr>
<td>Divided Attention</td>
<td>14</td>
</tr>
<tr>
<td>Divided Attention 2</td>
<td>22</td>
</tr>
</tbody>
</table>

Press ESC to change level of difficulty.

Training Modules
Start with Attention and Concentration Training

Tasks too hard? Go to Alertness Therapy
Tasks too easy? Go to Spatial Attention or Divided Attention
Training Modules

Attention and Concentration Training

- Easy
  - Alertness Modules
    - Alertness
    - Reaction Behaviour
    - Responsiveness
    - Vigilance

- Hard
  - Spatial Attention Modules
    - Spatial Operations
    - 3D Operations
    - Spatial Operations 3D

- Harder
  - Divided Attention Modules
    - Divided Attention
    - Divided Attention 2

Memory

The next most common deficit is Memory.

Memory Therapy with CCT

Long-term Memory

Did You Know? Children under the age of about seven pick up new languages easily without much conscious thought, using procedural (implicit) memory. Adults have to actively learn the rules and vocabulary of a new language using declarative (explicit) memory.
RehaCom for TBI/Stroke Rehabilitation
Peter Entwistle, PhD, HSSP & Anne-Marie Kimbell, PhD, MSEd
March 28, 2018

Training Modules
Six (6) Memory Modules

<table>
<thead>
<tr>
<th>Modules</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Memory</td>
<td>70</td>
</tr>
<tr>
<td>Topological Memory</td>
<td>20</td>
</tr>
<tr>
<td>Physiognomic Memory</td>
<td>21</td>
</tr>
<tr>
<td>Memory for Words</td>
<td>30</td>
</tr>
<tr>
<td>Figural Memory</td>
<td>9</td>
</tr>
<tr>
<td>Verbal Memory</td>
<td>10</td>
</tr>
</tbody>
</table>

Memory Training

- Working Memory: Short-term and selective memory, mental manipulation.
- Topological Memory: Picture cards are turned over, memorize positions and screens.
- Physiognomic Memory: Memorize up to 10 words in 3 degrees of complexity.
- Figural Memory: Figural content, picture-word association, captions, aphasia.
- Memory for Words: Short stories are presented; multiple choice questions.
- Verbal Memory: Memorize faces, names, occupations, and phone numbers. Can be personalized.

Executive Functions

Executive Functions, such as planning and logical reasoning, are important for the patient’s return to daily life.
Executive Function

- Necessary for “Purposeful” Behavior
- Necessary for ALL ADL’s
- Directs All other Cognitive Functions
- Affects Cognitive Rehabilitation
- 2nd Most Common Deficit after a Stroke / TBI (~ 75% of Patients)

Executive Function: “The coordination of multiple cognitive functions to produce a coherent, goal-directed result”

Training Modules

Three (3) Executive Functions Modules

<table>
<thead>
<tr>
<th>Modules</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical Reasoning</td>
<td>18</td>
</tr>
<tr>
<td>Plan a Vacation</td>
<td>55</td>
</tr>
<tr>
<td>Shopping</td>
<td>23</td>
</tr>
</tbody>
</table>

• The Executive Functions modules provide activities that are more ecologically meaningful such as planning a shopping trip, planning a vacation, etc.
• We expect people will better understand why they would need to train on these activities because they make a difference in their daily lives.
• Patients want to resume self-reliance. These training activities are more obviously relevant to accomplish this.
VisuoSpatial Therapy with CCT
Basics of VisuoSpatial Processing

“Spatial Skills”

Depth Perception, Vertical, Horizontal
Mental Rotation
Mental Maps

VisuoSpatial Therapy with CCT
Basics of VisuoSpatial Processing

“Visuo-Constructive Skills”

Assembling 2-Dimensional Objects
Assembling 3-Dimensional Objects

VisuoSpatial Therapy with CCT
VisuoSpatial Processing and ADLs

Reading (Shapes, Positions)
Grasping Objects (Depth Perception)
Dressing (Mental Imagery, 3D Assembly)
Navigating (Mental Imagery / Mapping)
Reading a Clock (Angles)
VisuoSpatial Therapy with CCT
VisuoSpatial Processing and ADLs

VisuoSpatial Therapy with CCT
VisuoSpatial Processing and ADLs

VisuoSpatial Therapy with CCT
VisuoSpatial Processing and ADLs

VisuoSpatial Therapy with CCT
VisuoSpatial Processing and ADLs

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Assembling 3-Dimensional Objects

VisuoSpatial Therapy with CCT

VisuoSpatial Processing and ADLs

Diagnosing VisuoSpatial Processing Deficits

Often difficult to distinguish from motor skill, praxis and memory deficits

VisuoSpatial Therapy with CCT

Training Modules

Visual Field

Approximately 1 in 5 stroke and TBI patients experience Visual Field deficits.
• Predominant Pathway for Receiving Information

• Common Deficit Immediately after Stroke (45% - 60% of Ischemic Patients)

• Less Common as Long-term Deficit after Stroke (8% - 25% of Ischemic Patients)

• Relatively Uncommon Deficit after TBI (5% - 10% of Patients)… however Vision Problems very Common after TBI

• Affects Cognitive Rehab, ALL Areas of ADL's

Visual Field:
“The entire expanse of space visible at a given instant without moving the eyes”

Patients Often Unaware of Visual Field Deficits

Patient May Notice Consequences (e.g. Bumping into Things)

Often Blame Problems on Other Causes (e.g. Poor Lighting)

Recognizes Visual Field Loss, But Thinks it is a Vision Problem

Visual Field Deficits

RehaCom for TBI/Stroke Rehabilitation
Peter Entwistle, PhD, HSSP & Anne-Marie Kimbell, PhD, MSEd
March 28, 2018

Training Modules
Three (3) Visual Field Modules

<table>
<thead>
<tr>
<th>Modules</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saccadic Training</td>
<td>34</td>
</tr>
<tr>
<td>Restoration Training</td>
<td>1</td>
</tr>
<tr>
<td>Overview and Reading</td>
<td>52</td>
</tr>
</tbody>
</table>

Training Modules
Visual Field Training

Saccadic Training
Eye movement training, hemianopia, neglect.
Click the correct arrow button depending upon which side of the screen an object appears.

Restoration
Stimulates the re-organization of damaged, but not destroyed, neuronal structure through intense stimulation.
Look at fixation point and respond to changes of central stimulus and stimuli emerging in the blind area of your visual field. Keep eyes focused upon fixation point.

Overview & Reading
Parallel and sequential search on the homonymous visual fields.
Searching for one letter among groups of letters.

Therapy Results
Therapy Results

On the Dashboard, on the left side under "Parameters", click "Results" to access this screen.

More detailed information is accessible in this area.

Data can be printed or exported to PDF or Excel.

Configuration allows adding information to reports such as clinic name.

All training modules for this patient are listed.

Progression through levels of training over several sessions.

On the "Results" tab to view progress and session data in graphical format.

Navigate to the "Results" tab to view progress and session data in graphical format.

Operating RehaCom

Computer-assisted RehaCom Setting

• Quiet
• Minimal Distractions
• Comfortable
• Soft Lighting
• Multiple Work Stations?
• Headphones?
• Laptop
• Networked?
Operating RehaCom

Technical Requirements

To run RehaCom you will need:
• Windows Laptop or Desktop Computer
• 19" - 21" Monitor
• 2 GB RAM
• Direct3D Graphics Card (Nvidia, ATI)
• USB drive
• 100 GB Hard Drive
• Printer

To install RehaCom:
• You must be logged into your computer with Administrator access.
• RehaCom software is installed from a USB drive.
• Licenses are managed via the RehaCom panel or optional dongle which must be connected to run RehaCom.

Summary and Conclusion

RehaCom Summary

Training Domains
Computerized Cognitive Training (CCT)
in 4 Major Cognitive Domains:
• Attention
• Memory
• Executive Function
• Visual Field

Features and Benefits
• 9 screening modules to identify deficits
• 20+ configurable training modules
• RehaCom keyboard to accommodate motor deficits
• Progress monitoring and/or outcome reports of patient therapy can be viewed, printed, and exported
• System is auto-adaptive to meet each patient at their current level of need
Summary and Conclusion

RehaCom Summary

Environments
• NeuroRehab
• Skilled Nursing
• Private Practice

Patients/ Clients
Patients suffering from cognitive deficits resulting from
• degenerative neurological disorders,
• TBI,
• stroke,
• or other clinical conditions impacting cognitive functioning.

Training
• Can be restorative or compensatory training
• All modules are configurable based on clinical need and client variables
• Clients work in clinic/hospital or rehabilitation setting
• High ceilings for training provides a comprehensive range of training levels

Efficacy Research
Approximately 20 peer-reviewed studies showing some positive effects across TBI, Stroke, Dementia, ADHD, MS. RehaCom is one aspect of the total rehabilitation program for patients.

Pricing
Unlimited use per station with volume discounts.

Reimbursement Opportunities
Research Evidence

RehaCom has evolved since it was first launched 25 years ago. It was developed by therapists and is meant to be used by therapists. RehaCom’s origins date back to 1986 when Professor Hans Regel (Neuropsychologist) first started doing research in the field of attention. Since then, numerous studies and results of research covering diverse areas have proven the effectiveness of RehaCom.

Research

RehaCom Research

Stroke

- Effect of computerized cognitive rehabilitation program on cognitive function and activities of living in stroke patients (Yoo et al., 2015)
- Clinical Efficacy of Acupuncture Treatment in Combination With RehaCom Cognitive Training for Improving Cognitive Function in Stroke: A 2 × 2 Factorial Design Randomized Controlled Trial (Jiang et al., 2016)
Stroke/ Memory impairments, Germany: A Randomized Double-Blind Controlled Study Investigating the Efficacy of a Working Memory Training During Stroke Rehabilitation

Kim Merle Richter, MSc, Claudia Molden, MSc, Paul Eling, PhD, Helmut Hildebrandt, Prof.
Published online before print April 2, 2014

OBJECTIVES: Memory training in combination with practice in semantic structuring and word fluency has been shown to improve memory performance. This study investigated the efficacy of a working memory training combined with exercises in semantic structuring and word fluency and examined whether training effects generalize to other cognitive tasks.

METHODS: In this double-blind randomized control study, 36 patients with memory impairments following brain damage were allocated to either the experimental or the active control condition, with both groups receiving 9 hours of therapy. The experimental group received a computer-based working memory training and exercises in word fluency and semantic structuring. The control group received the standard memory therapy provided in the rehabilitation center. Patients were tested on a neuropsychological test battery before and after therapy, resulting in composite scores for working memory, immediate, delayed, and prospective memory; word fluency; and attention.

RESULTS: The experimental group improved significantly in working memory and word fluency. The training effects also generalized to prospective memory tasks. No specific effect on episodic memory could be demonstrated.

CONCLUSIONS: Combined treatment of working memory training with exercises in semantic structuring is an effective method for cognitive rehabilitation of organic memory impairment.

A Randomized Controlled Trial Comparing 2 Interventions for Visual Field Loss With Standard Occupational Therapy During Inpatient Stroke Rehabilitation

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OBJECTIVES: Compensatory and restorative treatments have been developed to improve visual field defects after stroke. However, no controlled trials have compared these interventions with standard occupational therapy (OT).

METHODS: A total of 45 stroke participants with visual field defect admitted for inpatient rehabilitation were randomized to restorative computerized training (RT) using computer-based stimulation of border areas of their visual field defects or to a computer-based compensatory therapy (CT) teaching a visual search strategy. OT, in which different compensation strategies were used to train for activities of daily living, served as standard treatment for the active control group. Each treatment group received 15 single sessions of 30 minutes distributed over 3 weeks. The primary outcome measures were visual field expansion for RT, visual search performance for CT, and reading performance for both treatments. Visual conjunction search, alertness, and the Barthel Index were secondary outcomes.

RESULTS: Compared with OT, CT resulted in a better visual search performance, and RT did not result in a larger expansion of the visual field. Intragroup pre–post comparisons demonstrated that CT improved all defined outcome parameters and RT several, whereas OT only improved SPA.

CONCLUSIONS: CT improved functional deficits after visual field loss compared with standard OT and may be the intervention of choice during inpatient rehabilitation. A larger trial that includes lesion location in the analysis is recommended.

Research

Research Studies with TBI, CVA & MS

Traumatic Brain Injury

- Attention remediation following traumatic brain injury in childhood and adolescence by (Giliberti et al., 2009).
- Clinical Impact of RehaCom Software for Cognitive Rehabilitation of Patients with Acquired Brain Injury, (Fernandez et al., 2012)
- Effectiveness of Cognitive Rehabilitation Following Acquired Brain Injury: A Meta-Analytic Re-Examination of Cicione et al’s (2000, 2005) (Roehling et al., 2009)
Clinical Impact of RehaCom Software for Cognitive Rehabilitation of Patients with Acquired Brain Injury

Elizabeth Fernández, María Luísa Bringas, Sonia Salazar, Daymí Rodríguez, María Eugenia García and Maydane Torres in MEDICC Review, October 2012, Vol 14, No 4

We describe the clinical impact of the RehaCom computerized cognitive training program instituted in the International Neurological Restoration Center for rehabilitation of brain injury patients. Fifty patients admitted from 2008 through 2010 were trained over 60 sessions. Attention and memory functions were assessed with a pre- and posttreatment design, using the Mini-Mental State Examination, Wechsler Memory Scale and Trail Making Test (Parts A and B). Negative effects were assessed, including mental fatigue, headache and eye irritation. The program’s clinical usefulness was confirmed, with 100% of patients showing improved performance in trained functions.