Computer based
cognitive rehab solution

RAPAEL

ComCog
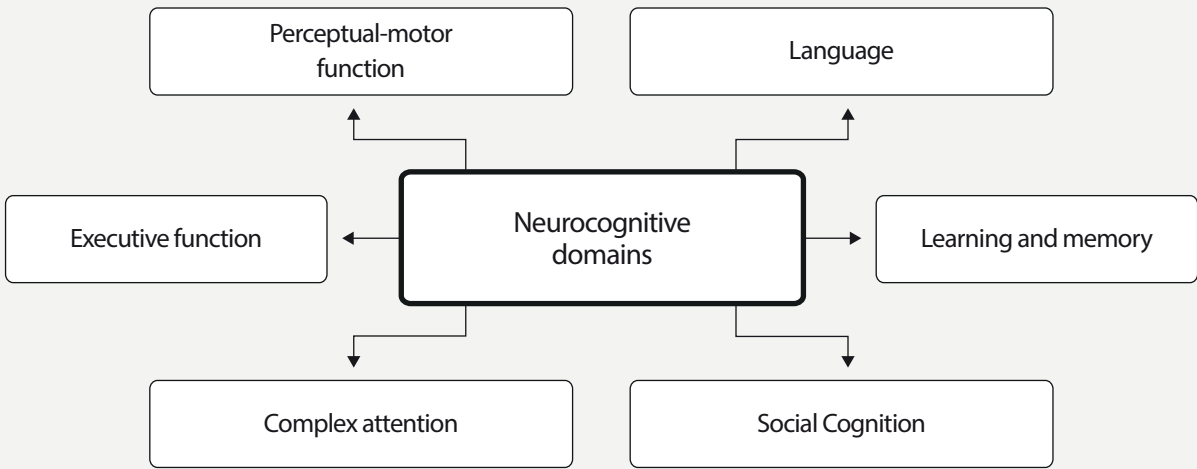

NEOFECT

BASIC APPROACH TO COGNITIVE REHAB

RPAAEL ComCog approaches cognitive rehabilitation with sprial structure, so as to promotes relearning and retraining of damaged cognitive functions.

Importance of Cognitive Rehabilitation

Cognitive function refers to a capability to adapt to an environment by comprehending, judging, and making a decision in everyday life[1]. Damages to the cognitive functions hinders rehabilitation, and promoting brain plasticity is the key element to the rehabilitation. Cognitive rehabilitation have its utmost interest on relearning and retraining[2].

DSM-5 defines cognitive function with 6 major domains[3]; cognitive domain includes fundamental area of concentration and memory and higher area of planning, organization, problem solving, and abstraction. Integration of sense, language, and visual-perceptual abilities is the very base of the area[4].

The DSM-5 approach : Neurocognitive disorders
(Diagnostic and statistical manual of mental disorders 5th edition)

Perceptual-motor function	Language

Neurocognitive domains

Executive function		Learning and memory

Complex attention	Social Cognition

Basic Approach to Cognitive Rehabilitation

In general cognitive training, it is efficient to progress from the bottom to the top, and from the simple and the complicated: the spiral structure. RAPAEL ComCog designs its cognitive rehabilitation to be done with Hierarchical Approach, which deals with the coverage of attention, perception, discrimination, organization and memory.

Hierarchical Processing Model of Cognition[5]

- · Arousal / alerting
- · Perception, selective attention
- · Discrim ination
- · Organization
- · Memory, recall
- · High-level thought processing

Ref. [1] Najenson T, Rahmani L, Elazar B, et al. An Elementary Cognitive Assessment and Treatment of the Craniocerebrally Injured Patient. New York, Plenum. 1984.

[2] Glisky EL, Schacter DL, Tulving E. Learning and retention of computer-related Vocabulary in memory-impaired patients: method of vanishing cues. J Clin Exp Neuropsychol. 1986;8:292-312

[3] Sachdev, P. S. et al. (2014) Classifying neurocognitive disorders: the DSM-5 approach Nat. Rev. Neurol. doi:10.1038/nrneurol.2014.181

[4] Wheately CJ. Evaluation and treatment of cognitive dysfunction. In: Occupational Therapy Practice Skills of Physical Dysfunction. 4th ed. St. Louis, Mosby. 1995;241-252.

[5] Adamovich BB, Henderson JA, Auerbach S. Cognitive Rehabilitation of Closed Head Injured Patients: A Dynamic Approach. London: Taylor & Francis; 1985.

WHY RAPAEL COMCOG?

RAPAEL ComCog innovated itself by combining the strengths of Computer-assisted program and RAPAEL.

Strength of CACR[1]

CACR program shows notable enhancement of brain damaged patients in memory, problem solving, attention training[2].

Coherent Repeated Learning
Standardized repeated learning adapted to all therapists and patients.

Stepwise Refinement of Difficulty Level
Provide automatically customized difficulty level to individual patients.

Instant Feedback
Provide immediate feedback on performance.

Cure Effect Quantification
Determine the effect by an accurate note and analysis on patients' performance.

NEW RAPAEL ComCog

RAPAEL maximized the concentration of users with a new design and a way to touch the screen, collaboratively developed by the experts from different disciplines.

Collaborative Expert R&D
Developed by the experts from different disciplines: clinicians, therapists and engineers.

Training Design Reinforcement
Improve interest and concentration by changing contents and graphic in regard to the purpose.

Instinctive User Experience
UX reinforced for therapists and patients to have a good understanding of progresses and results of the training.

ALL Touch Screen
Touch screen adapted for the convenience sake of the patients' uses.

Ref. [1] Computer-assisted Cognitive

[2] Zoltan B. Vision, Perception and Cognition. 3rd ed. New Jersey, Slack. 1996.

RAPAEL COMCOG PLATFORM & CONTENTS DESIGN

RAPAEL platform enables therapists of easy and systematic training, while patients are able to experience it with much interest and concentration

Rehab information Processing & Key Features

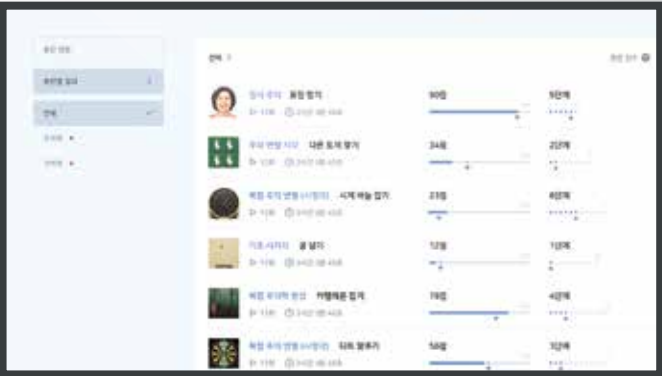| Instinctive Selection	Convenient Use	Training Immersion	Training Performance and Report

Training Selection per Specific Purposes
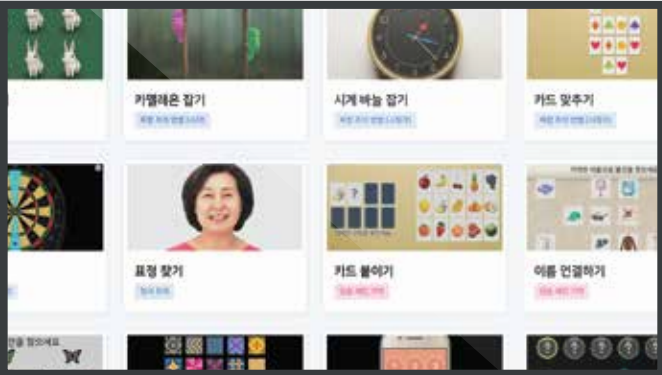

Touch Input

Reinforced Design Meeting the Purpose

Comprehensive Result per Training Purposes

Instinctive Images Screen

Training Managing Widget

Contents Difficulty Segmentation

Core Result per Each Training

RAPAEL COMCOG CONTENTS INSTRUCTION

Attention Training

Collecting Balls
Basic Visual Perception

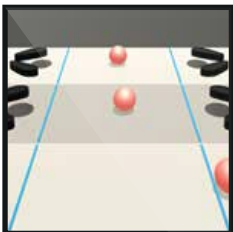Visual attention
strategy training

Catching Chameleons
Complex Attention Discrimination

Reaction training to
complex visual stimuli

Hearing Sounds
Basic Auditory Perception

Attention discrimination
training on auditory
directions

Grabbing Hands of Clock
Complex Attention Discrimination

Visual / Auditory complex
attention training

Holding Balls
Maintaining Attention

Attention / Distance
perception training

Matching Cards
Complex Attention Discrimination

Visual / Auditory complex
attention training

Catching Sounds
Maintaining Attention

Attention discrimination
training on auditory
directions

Playing Darts
Complex Attention Discrimination

Visual / Auditory complex
attention training

Determining a Different Rabbit
Attention Discrimination

Visual attention
discrimination training

Finding a Face
Emotional Attention

Sympathy training

Memory Training

Pasting Cards
Recognition Memory

Space memory
ability training

Playing a Musical Instrument
Sequential Recalling

Sequential recalling
training by auditory stimuli

Linking Names
Recognition Memory

Attention holding
ability training

Connecting Sounds
Sequential Recalling

Establishing memory
strategy by auditory stimuli

Collecting Stuffs
Space Memory

Remembering features
/ Location of visual stimuli

Connecting Numbers
Associate Memory
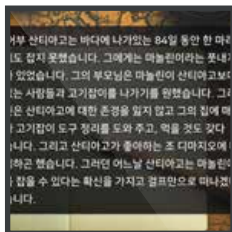
Verbal-Non verbal
complex memory training

Selecting Tiles
Space Memory

Remembering features
/ Location of visual stimuli

Group Memory
Verbal Categorizing Memory

Memory training by
categorization

Making a Call
Sequential Recalling

Establishing memory strategy
by sequential memorizing

Story Memory
Language Integration

Memory improvement
by video training

RAPAEL COMCOG EVOLUTION PLAN

Training Program Development By Additional Cognitive Purpose

Maximize the training effect by developing specified cognitive rehabilitation training per various reasons of brain function deterioration.

Additional Training	Details
Visuospatial Perception	Accurately perceives and represents an object, and transforms spatial information.
Execution Function	Obtains needed information and coordinates behaviors.
Emotion	Controls psychological · physiological status related to various emotions, thoughts, and behaviors.
IADL	Requires more advanced problem solving ability than common factors does, which demands basic functions.

Initial Assessment System Development

Develops a customized algorithm for each patient and recommend a suitable through an optimized assessment process.

Assessment → Algorithm → Training Recommendation
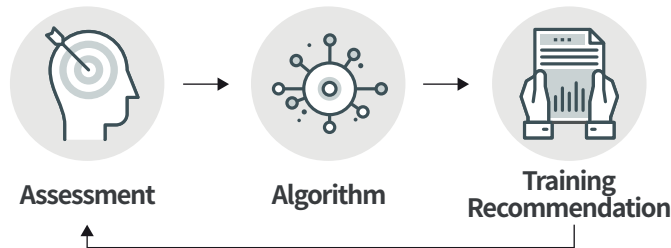
Training Program Development by Disease

A solution fit to each disease's purpose approaches patients' varied training, in order to ease the access from institutions and local communities

Aging / Dementia
· Memory Training
· Frontal Lobe Function Enhancement
· Execution Function Training

Stroke
· Attention Training
· Unilateral Neglecting Visual perceptive Training
· IADL Training

Traumatic Brain Injury
· Cognitive Behavior Control Training
· Emotion Control Training
· Attention, Memory Training

Depression / Emotional Disturbance
· Emotion Control Training
· IADL Training

NEOFECT EXPANSION OF LINE-UP

Product Family	Device Type	2014	2015	2016	2017	2018	2019
Cognitive					ComCog (+ Attention Memory)	ComCog (+ Visuospatial Neglect etc)	ComCog (+ Emotion etc)
Shoulder / Elbow	Active				Smart Board	Smart Shoulder / Smart Arm	Upper Assist
Hand	Active	Smart Glove		Smart Kids	Smart Pegboard		
Hand	Assistive					NeoMano Glove	
Platform		RAPAEL 1.0	RAPAEL 1.2		RAPAEL 2.0 (+ Multi-Device)	Platform	Platform

COMPONENT

- RAPAEL ComCog Software
- Touch Screen Android Tablet PC (21")
- Manual: 1ea

RAPAEL
ComCog

ABOUT NEOFECT

NEOFECT was founded to create hope for better life and better world. NEOFECT believes that any patient is deserved to enjoy happy life with hope for full recovery. NEOFECT has vision to help more patients take advantage of advanced digital and robot technologies through developing and commercializing light, portable, and affordable rehabilitation solutions. Please look forward to more products to launch and join us in our journey to make meaningful impact through disruptive innovation for patient's hope.

CES INNOVATION AWARDS 2017 HONOREE   CNN   c|net   ZDNet

PRODUCT DEVELOPMENT & CLINICAL PARTNERS

National Rehabilitation Center

Seoul National University

KAIST, Korea Advanced Institute of Science and Technology

UNIST, Ulsan National Institute of Science and Technology

Rehabilitation Institute of Chicago

Samsung Medical Center

Yonsei University Hospital

Seoul National University Hospital

Bundang Jesaeng General Hospital

Kunming Medical University

RAPAEL

ComCog

We inspire hope