



Rehabilitation of Cognitive Disorders after Stroke

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ASUITS

Bibione, 26 ottobre 2018



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Rehabilitation of Cognitive Disorders after Stroke: Why?

- Brain injury (such as Stroke, or TBI) produces a complex constellation of medical consequences including physical, emotional and cognitive deficits
- Cognitive impairments are among the most critical determinants of ultimate rehabilitation outcome
- Therefore, cognitive rehab represents an integral component of brain injury/neuro-rehabilitation

Definitions of NEURO-REHABILITATION



- Implies the restoration of patients to the highest level of physical, psychological and social adaptation attainable. It includes all measures aimed at reducing the impact of disabling and handicapping conditions and at enabling disabled people to achieve optimum social integration (WHO, 1986)
- A problem-solving process in which the person acquires the knowledge, skills and supports needed for their optimal physical, psychological, social and economic function

Neuropsychological Rehabilitation can be described as **any intervention, strategy or technique which enables patients and their families or carers to live with, manage, by-pass, reduce or come to terms with cognitive deficits**

(Wilson 1999)

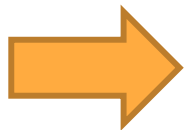


What is Cognitive Rehabilitation



- The application of **techniques and procedures** and the implementation of supports to allow individuals with cognitive impairment to function as safely, productively and independently as possible (Mateer, 2005)
- **A two-way interactive process** whereby people with neurological impairments work with professional staff, families, and community members to alleviate the impact of cognitive deficits (MacLennan, 2009)
- Based upon **sound scientific theoretical constructs**

- **Models of Cognitive Processing** taken from cognitive psychology and (clinical) neuropsychology
- **Neuroplasticity**, the ability of the CNS to respond by reorganizing its structure, function and connections as an answer to pathologic events (stroke, TBI; ...)



Spontaneous Recovery Mechanism

- **Measurement of treatment efficacy** to determine:
 - ✓ whether and which interventions result in functional gains, reduction of handicap
 - ✓ whether gains are maintained over time
 - ✓ whether gains result in better outcomes than would be expected without provision of rehabilitation

Different Approaches to Cognitive Rehab

Interventions for cognitive rehabilitation are broadly classified as:

- 1. RESTORATION:** Direct remediation/cognitive skill training to re-establish previously learned patterns of behaviour
- 2. COMPENSATION:** Compensatory strategy training, establishing new patterns of cognitive activity through internal compensatory cognitive mechanisms
- 3. ACCOMODATION:** establishing new patterns of activity through external compensatory mechanisms such as external aids, environmental structuring and support.



COGNITIVE TREATMENTS



Focused on improving a particular domain:

- attention
- Memory
- Executive functions

Using specific repetitive exercise

Aimed at improving performance of a particular activity:

- Using compensatory abilities
- Learning alternative strategies

- No single ‘right’ intervention in cognitive rehabilitation
- A variety of methods are available to treat attention, memory, and executive function....
- Selection of a specific approach may depend on a number of factors:
 - ✓ patient’s preferences
 - ✓ specific needs of the patient
 - ✓ timelines for treatment
 - ✓ previous treatment
 - ✓



MeMori-net Cognitive Approach & Rationale



Training specific cognitive processes with a goal of improving the underlying cognitive impairment

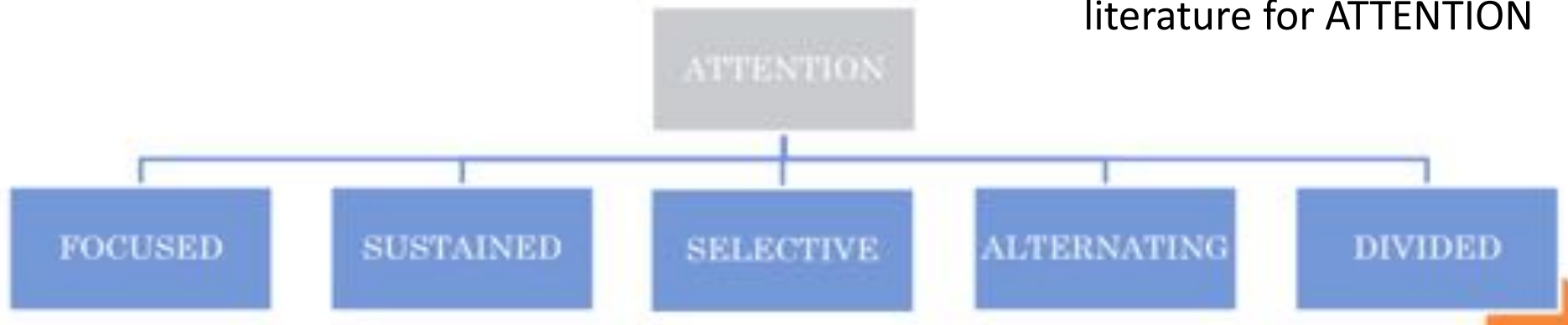
- Drills focus on a specific cognitive processes
- Drills are repeated over time & level of difficulty is increased with progress
- Tasks are not functional but are intended to target processing of specific cognitive networks

(Sohlberg, 2013)

Rehab tasks are organized according to a theoretical model

- Working from a model:
 - ✓ ensures a scientific basis for treatment hierarchies
 - ✓ supports systematic implementation of therapy as it informs assessment and treatment tasks

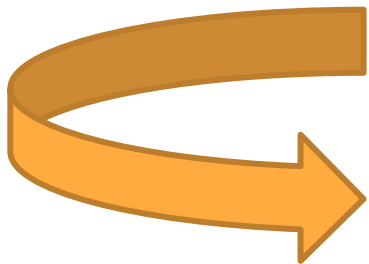
A theoretical model supported in the literature for ATTENTION





Use performance data to direct therapy

- Different measures of performance may be relevant to the target goal: e.g. accuracy, latency of response, time to completion
- Exercises may improve due to practice effects!



*Must evaluate generalization of training
to functional goals*



(Sohlberg, 2013)



Provide sufficient repetition

- Sufficient intensity of training is critical for facilitating reorganization of brain networks and/or establishing a cognitive skill so that it becomes automatic

(Sohlberg, 2013)

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Realized by:



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Cognitive Rehab Protocol & APPs



- It will be performed from T1 to T3
- Duration of each session will vary between 30-50 min
- 3 rehab sessions x week will be performed, for 8 weeks
- 10 exercises have been created, training 5 sub-components of executive functions (working memory, planning, inhibition, shifting and attention)
- Tasks are designed with increasing difficulty levels:
Pts go to the next level if 75% of stimuli are correct





MeMori-net Cognitive Rationale



- Unlike classical paradigms, patients will perform a complete set of exercises to promote the activity of fronto-parietal circuits and the recovery of Central Executive Network.
- Executive disorders are increasingly being acknowledged as a recurring consequence of anterior, posterior and subcortical stroke, can interfere with the process of rehabilitation, may play a critical role in predicting functional recovery (Jankowska et al., 2017)
- Expectations: enhancement of the transversal power of treatment, wider generalization to real life





MeMori-net Cognitive Rationale

- The psychosocial consequences of executive dysfunctions are often more dramatic than motor problems and are the cause of permanent disability after stroke
- Executive functions are involved in almost every human activity: they integrate and organize complex cognitive processes to make behavior planned, purposeful, conscious and selective





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Benvenuto! Scegli l'abilità che vuoi esercitare:



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1 2 3 4 5 6 7 8 9 10

L'IMPREVISTO

1 2 3 4 5 6 7 8 9 10



ATTENZIONE

CHI CERCA TROVA





ATTENZIONE

CHI CERCA TROVA





ATTENZIONE

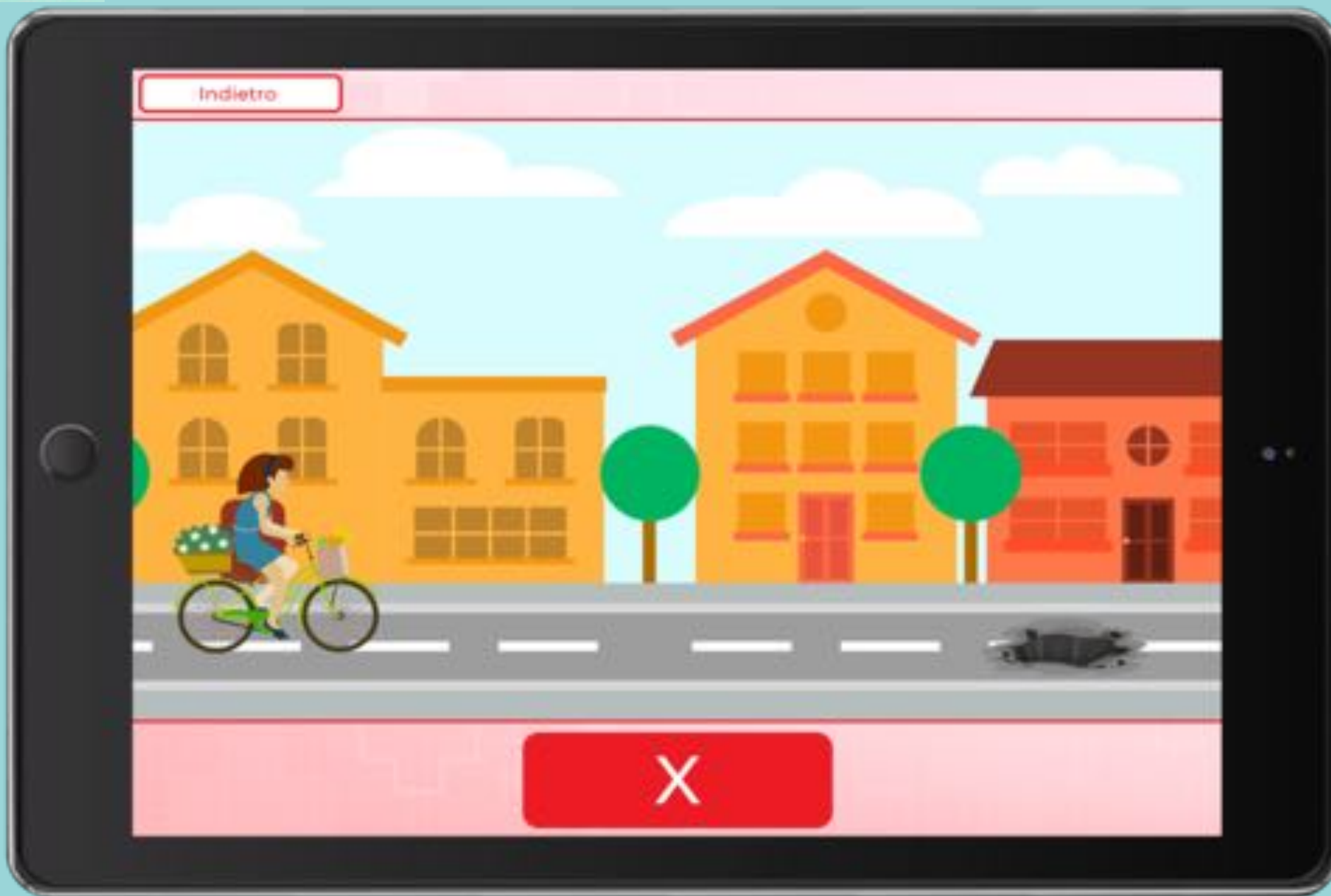
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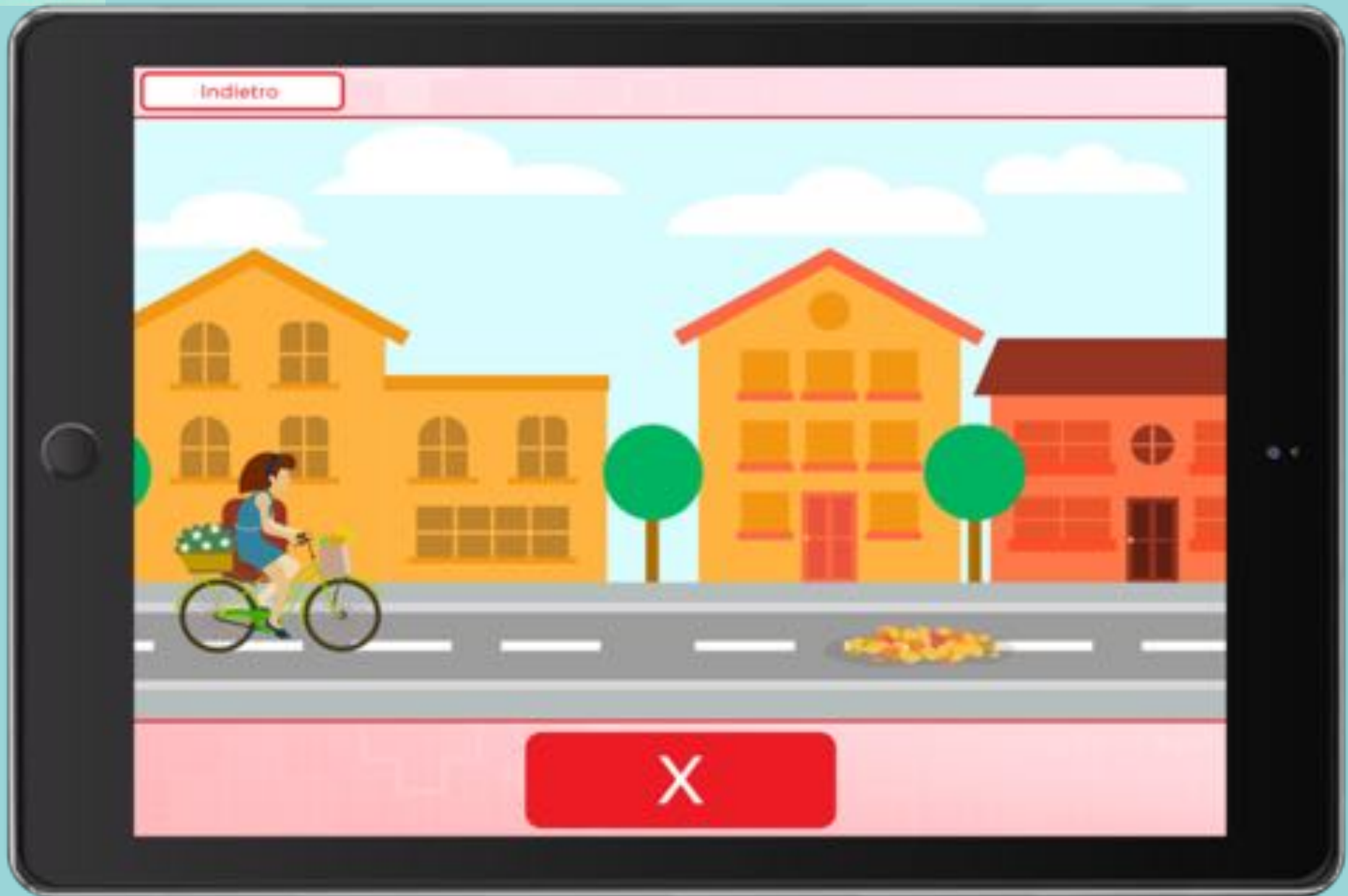
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PIANIFICAZIONE

PIANIFICA LE TUE MOSSE





PIANIFICAZIONE

PIANIFICA LE TUE MOSSE



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Aiello, M.**



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THANK YOU!

FINITO!



**Special
thanks to:**



Luca Specchio

Fabio Battilani

Progetti di Impresa S.r.l.

Via C. Zucchi, 21 - 41123 Modena



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