MARCELLO MARIO PIERRO AND THE CULTURAL BACKGROUND OF THE GIPCI GROUP

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Marcello Mario Pierro was in 1995 a co-founder of the Italian Group on Cerebral Palsy (GIPCI group), whose main aim was to create a network among Italian clinicians (physiotherapists, physicians and psychologists) involved in rehabilitation of children with Cerebral Palsy. The meetings periodically organized by the GIPCI group had the purpose of discussing clinical cases, of sharing the methodology of the clinical assessment and treatment, and then of defining common protocols of rehabilitation. Dr. Pierro, with his enthusiastic, but still rigorous fondness for Neuroscience, promoted a constructive discussion among the different operators involved in rehabilitation and pointed to the main objects of the therapeutic practice: a thorough scientific knowledge of the architecture of the adaptive functions, as a requisite to define the rationale of the therapeutic intervention; the identification of the objects and instruments of rehabilitation as a tool to pursue the possible changes; the definition of appropriate parameters to evaluate and verify the results of therapeutic intervention.

THE ECOLOGICAL REHABILITATION IN THE TREATMENT OF CEREBRAL PALSY

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Gibson (1979) termed an “affordance” the match between the body and the environment that makes a particular action possible. Actions can succeed only if they are scaled to the properties of the body and the environment. Motor decision making involves an integration of perceiving possibilities for action and evaluating the risks and rewards associated with possible outcomes. The Child with brain damage may be insensitive to some information in the environment and for this reason may be difficulty in interpreting them as opportunities for action. The Ecological Rehabilitation is concerned with affordances to make the characteristics of the objects, contexts and actions readable by the child with cerebral palsy and allow him to seize the opportunities of action in their natural living environment.
ECOLOGICAL VISION

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M.M. Pierro and G. Sabbadini have significantly contributed, in an "ecological vision", to the rehabilitation of visual disorders in CP. CVI is the most common bilateral visual disorder in children in the western world, expressing damage or malfunctioning of retrochiasmatic visual pathways. (Fazzi 2009) The incidence in children with CP is approximately 60–70 %. Many of them often present abnormal evolution of gnosis and visual-spatial capacities. Such difficulties could express maturation and integration abnormalities of the two primary visual systems: the ventral and the dorsal pathways. Continuing the work started with G. Sabbadini and M.M. Pierro, we tried to define and to verify the effectiveness of an early specific visual-cognitive training on children affected by CP and cerebral visual impairment (CVI). The program includes visual perceptual tasks and a new software program.

COGNITIVE STRATEGIES OF LOCOMOTOR NAVIGATION IN NORMAL DEVELOPMENT AND CEREBRAL PALSY

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Spatial memory and visual spatial abilities are frequently affected in children with spastic Cerebral Palsy (CP). Several clinical tools assess spatial skills in near space, but none extends to far, i.e. navigational space. The Walking-Corsi test is an attempt to translate the classical Corsi Block-tapping Test (CBT) into a navigational task. The Magic Carpet (MC) and the CBT have been administered to a group of typically developing children (TDC) and in children with spastic CP (CPC). General intelligence and MRI scans were also assessed in CPC. The results indicate that navigation requires different cognitive strategies than visual spatial memory in near space. In TDC, performance increased with age both on the CBT and on the MC, but relatively more in navigation. CPC scored lower than age-matched TDC on both tests with significant correlation with localisation and extension of brain lesions.
REHABILITATION AND NEUROSCIENCE

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The rationality underlying any therapeutic approach in the treatment of child disabilities has its roots in neuroscience. In order to be properly evaluated, every therapeutic methodological technique should to be compared with the level of knowledge in neurophysiology at the time in which it was proposed. Consequently, the extraordinary continuous progress in neurophysiology demands a constant renewal of the rehabilitation methods employed for recovery, especially in the field of cerebral palsy. In the ecologic approach to rehabilitation, this process has been reversed. In fact, the conviction that rehabilitation had to be carried out in a meaningful environment for each child, taking into account their motivation and enriched by dynamic acting models, as proposed by enlightened authors such as Pierro, has received its scientific confirmation in neuroscience only recently. Indeed, the discovery of mirror neurons has demonstrated the importance of models for automatic learning through the imitation process, whereas canonical neurons are the basis for the selection of motor patterns, taken from personal repertoire, needed in order to interact with objects present in the proposed setting.

Finding the learning mechanisms which are more accessible for the cerebral palsied child is still an unresolved problem in which neuroscience and rehabilitation have to face and interact. In the hope that, one day, progress in regenerative medicine will be able to make the final breakthrough, understanding learning modalities in pathological conditions remains the last major problem to solve.

SUITING AN INDIVIDUAL REHABILITATIVE EXPERIENCE: UPDATES IN ECOLOGICAL APPROACH

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NEW TECHNOLOGIES: THE ROOTS AND THE PERSPECTIVES OF ECOLOGICAL REHABILITATION

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EVIDENCE-BASED MEDICINE AND THE REHABILITATION OF THE CHILD: A POSSIBLE CHALLENGE.
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“FURTHER EVALUATION IS REQUIRED…”: ORIENT OURSELVES IN PEDIATRIC NEUROREHABILITATION EVIDENCE-BASED PRACTICE.
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Researching evidence in paediatric neurorehabilitation may be a puzzling activity, giving an impression that in this field there is no certainty and generating behaviours inspired to: “since nothing is good, then all is good”. On the other hand, evidence-based practice could be interpreted as a “cook-book” approach to patient care, regardless neither of individual clinical expertise, nor of patient’s values. Combining the accuracy of EBM approaches with the “artisan workshop” supported by M. M. Pierro, we could get out of this impasse, achieving Sackett’s definition of EBM: the integration of clinical expertise, patient values, and the best evidence into the decision making process for patient care.

A DYNAMIC POSTURAL SYSTEM FOR CHILDREN WITH DYSTONIA: HISTORY AND REALIZATION.
Francesco Mattogno

EVIDENCE OF THE ECOLOGICAL APPROACH IN REHABILITATION: THE EXPERIENCE OF THE MOVEMENT ANALYSIS AND ROBOTICS LABORATORY
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With the term “Ecological Rehabilitation” Marcello Mario Pierro synthesized his attempt to construct an unified theory for the rehabilitation based on the more recent knowledge. He tried to combine self-organization and dynamical system theory, modern neurophysiology and neuro-chemical knowledge, familiar, social and cultural interactions. The main common element was the brain considered as the medium of the relationship between the organism and the environment. He gives detailed description as well as their connection map of each of this perspectives. Pathology manifests limits in the self-organization processes and adaptive behaviors. The rehabilitation should provide the experiences able to reopen the process of research of innovative solutions enhancing the adaptive repertory. The movement analysis and robotics laboratory should give evidence on rehabilitative proposals arising from the challenge with the complexity of the task.