

## REHABILITATIVE TREATMENT PROPOSALS IN PEDIATRIC NON-VERBAL SYNDROME

AGATA MALTESE<sup>1</sup>, MARGHERITA SALERNO<sup>2</sup>, GABRIELE TRIPPI<sup>3,4</sup>, PALMIRA ROMANO<sup>5</sup>, ANNACLAUDIA RICCIARDI<sup>6</sup>, GIULIA SESSA<sup>5</sup>, ANNABELLA DI FOLCO<sup>1</sup>, TERESA DI FILIPPO<sup>1</sup>, LUCIA PARISI<sup>1</sup>

<sup>1</sup>Department of Psychological, Pedagogical and Educational Sciences, University of Palermo, Italy - <sup>2</sup>Sciences for Mother and Child Health Promotion, University of Palermo, Italy - <sup>3</sup>Department PROSAMI, University of Palermo, Italy - <sup>4</sup>Childhood Psychiatric Service for Neurodevelopmental Disorders, CH Chinon, France - <sup>5</sup>Clinic of Child and Adolescent Neuropsychiatry, Department of Mental Health and Physical and Preventive Medicine; Università degli Studi della Campania "Luigi Vanvitelli", Italy

### ABSTRACT

*Nonverbal learning disability (NVLD) can be defined as a specific learning disorder peculiar for deficits in non-verbal area, such as visuospatial and visuo-constructive difficulties, fine motor coordination impairments, and poor mathematics achievement, associated with well-developed language skills. aim of the present work is suggesting rehabilitative proposal for management treatment of NVLD in pediatric age tailored on children and based on EBM.*

**Keywords:** *Nonverbal learning disability; NVLD; visuospatial abilities; rehabilitation; evidence based medicine (EBM).*

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### Introduction

Nonverbal learning disability (NVLD) can be defined as a specific learning disorder peculiar for deficits in non-verbal area, such as visuospatial and visuo-constructive difficulties, fine motor coordination impairments, and poor mathematics achievement, associated with well-developed language skills (1). Typically described as NVLD is also defined as nonverbal disorder of learning, visuospatial learning disability or right hemisphere developmental learning disability. Despite of different definitions, the NVLD crucial aspect may be identified in poor visuospatial skills, impaired visuo-constructive and visual perceptual skills and consequently impairment/deficit in visuospatial working memory<sup>(1-20)</sup>.

In this light, in the clinical practice NVLD is complicated to recognize and no clear therapeutic nor rehabilitative guidelines are disposable for children or adolescents affected.

The aim of the present work is suggesting rehabilitative proposal for management treatment of NVLD in pediatric age tailored on children and based on EBM.

### Rehabilitative treatment proposals

#### *Strengths and points of weakness identification*

In general, before planning the rehabilitative program, it is necessary to determine what are the strengths and weaknesses of affected children underlying subject.

For NVLD, the strengths are related to the left brain area skills that is not involved in the pathophysiology of disorder. Such strengths may not be visible in the small child, but they tend to be manifested with growth<sup>(21-45)</sup>.

*In this light the strengths are the following:*

- Good vocabulary;
- Good memory;
- Good attention for details;
- Early reading skills development
- Motivation to learn proper and adequate social behaviors

*The points of weakness are relate to skills linked to the right brain areas functioning:*

- Impairment for processing sensitive stimuli such as touch, visual attention and perception;
- Fine and gross motor coordination;
- Nonverbal communication;
- Reading abilities;
- Flexibility/Adaptability;
- Orientation in space and visual-space organization;
- Cognitive processes;
- Pragmatics of language;
- Generalization of information;
- Social Skills;
- Difficult to understand and learning social rules to establish appropriate behaviors;
- Emotional instability

### Neuro-psychomotor intervention

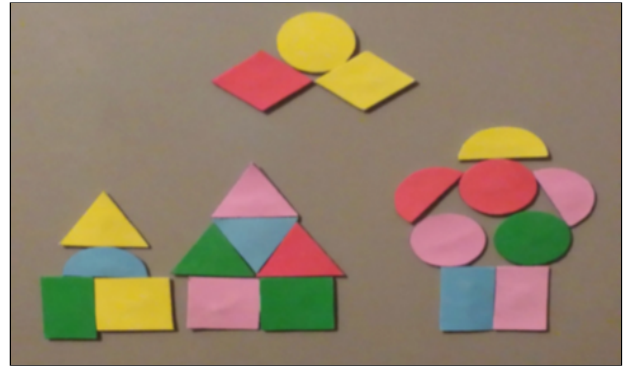
Determining strengths and weaknesses is critical to building the interactive profile, in order to capture the peculiar features of children and to place them within potential areas of development impaired. The multidisciplinary team's intervention is mandatory and necessary. Although nonverbal syndrome is a very serious disorder, the outlook for the child is good when and if diagnosed in time and whether rehabilitation interventions are adequate<sup>(46-60)</sup>.

Once covered and identified the areas of strength and weakness, it is necessary to define the dynamics of development within which the NVLD has emerged, and then determine what are the short, medium and long term goals to which the therapeutic project is based.

On the other hand, It's important to highlight that affected children are often smart and brilliant, so when the teaching is appropriate to their learning style, children will learn very quickly.

The global training activities include the enhancement of visual-spatial memory, attention and visual memory, tactile perception, fine motility, and space orientation<sup>(61-70)</sup>.

The enhancement of visual-spatial memory should be Implemented through playing activities such as "Memory" game or puzzles activities (Figure 1).



**Figure 1:** shows the example for enhancement of visual-spatial memory.

There may also be proposals for squares formed from squares inside of which objects are drawn which the child must remember the exact position. Labyrinths are also useful, along with which verbal instructions are provided to the child about how to walk. Other useful games include racket, Tetris, naval battle, or activities such as completing figures or rebuilding images. One could also ask him to recycle figures of different complexity and then color them, or to look at compositions made with geometric figures made of cardboard trimmings and then cover them by trying to remember the arrangement of all the cards<sup>(71-80)</sup>.

With regard to attention and visual memory, it is crucial to remember that very often the subject with NVLD has visual processing deficits and in eyes mobility, so it would be best to avoid asking him to copy directly from other books or sheets, because it will hardly be able to do so without transcription mistakes. In these cases, it would be best to provide you with a copy of the material, asking it to color it in the same way as the template provided. In some cases, NVLD children may have a tactile defense reaction, refusing to touch certain things. You must propose different materials and various tactile stimuli and teach them to give meaning to those stimuli. When it does react negatively, however, you do not have to force it. As far as fine motricity is impaired, these children have problems in holding the pencil to color or draw and/or to

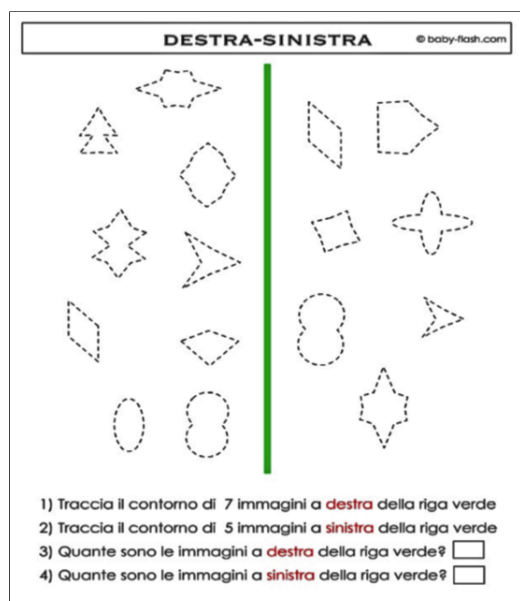
push a button into the shoulder. Proposing manual activities, you must first make sure you choose materials and tasks with a level of difficulty appropriate to your skills<sup>(60-70)</sup>.

Up to three to four years old, it could be to paint the baby or to paint it initially with very large and defined contour line, to gradually move to more thin contours line. Alternatively, even games with molding material such as plasticine, clay are useful<sup>(60-70)</sup>.

In children older than 5 years of life, once automated previous abilities, you might want to use writing tools. Children affected, aside from failing to hold the instruments correctly, tend to press too hard when writing, and could therefore break the sheet. It is useful in this case to use pencils with large mines and pens with erasable ink. Finally, through the symbolic game, you could begin to teach him/her to properly handle the cutlery, skills whose automation is also reflected in everyday life and on the level of domestic autonomy<sup>(71-80)</sup>.

Two of the peculiar characteristics of NVLD children are clumsy and in this light is necessary to arrange large spaces in room therapy, without the risk that the child can stumble and be very tidy. Order is a priority need for children with NVLD, while confusion is problematic.

Space and time perceptions may be useful in order to capture the child's spatial relationships between objects, in particular the concepts in-out, back and forth, right-left, before-after (Figure 2).



**Figure 2:** shows the space and time perceptions exercises.

You could suggest sense-motive activities, such as creating skittles, balls and circles, to improve balance. With regard to specific training activities, however, one has to focus on everything about the concept of nonverbal communication, ie chinese, proxima, chronemic, vocal prosody, body language, expression of the face, mind theory. Children with NVLD need to take into account their proximity and do not know that contains a message. In addition, because of their spatial difficulties, they may have an incorrect perception of their position with respect to other people or objects, so they may be too close to others or too far away. They do not know the concept of scanning of time, the different tones of voice, the multiple meanings of the sentence. First of all, you need to teach him how to interpret the various expressions of the face, accentuating them while speaking. As a facilitator you could use the mirror, make an expression and let it repeat while looking at the mirror. Another strategy could be the game of mime, which requires strongly emphasized body expression and expression. Through these games, the child will also effectively learn the respect of shifts and reciprocity. Deficits in the processing of non-verbal information are a major disadvantage for the development of complex cognitive abilities<sup>(81-100)</sup>.

Finally, you need to focus on action planning, through tasks within a workspace and writing order, in particular focusing on the space/magnitude relationship of the character. For the enhancement in the drawing area, you must start from the organization of the sheet, by designing a drawing and the subsequent use of drawing tools.

You could initially provide a model to follow, and then move on to free design to give value to what is personal observation of reality.

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*Corresponding author*

MARGHERITA SALERNO, MD  
Sciences for Mother and Child Health Promotion  
University of Palermo  
(Italy)