The Clinical Formulation Methodology for Neuropsychological Rehabilitation Intervention: The Comprehensive Model, the Cycle and the Flow Chart for the Rehabilitator's Reference

By Fabricia Quintão Loschiavo Alvares & Barbara A. Wilson

Nexus- Institute for Research, Teaching and Clinic in Neuropsychological Rehabilitation

Abstract- Neuropsychological Rehabilitation (NR) is understood as a process of using a wide variety of strategies deliberately centered on one person, which should stimulate his/her development, or the use of available resources to obtain a good occupational performance. Concerning this point, the intervention must be understood broadly, considering people in their contexts, activities and relationships. In order to attend these principles, the key element for success in proposing an NR plan is the active use, by the rehabilitator, of a clinical formulation process (CF). Considering the infinity of possible influences on an individual's overall level of functioning, the formulation of factors is extremely useful to guide all the people involved, from the clinical team to the patient's family, in order to understand the current problems faced by the person, to delineate the intervention and to prospect for future steps.

Keywords: neuropsychological rehabilitation, clinical formulation, model.

GJMR-A Classification: NLMC Code: WW 400

Strictly as per the compliance and regulations of:

The Clinical Formulation Methodology for Neuropsychological Rehabilitation Intervention: The Comprehensive Model, the Cycle and the Flow Chart for the Rehabilitator's Reference

Fabricia Quintão Loschiavo Alvares [α] & Barbara A. Wilson [σ]

Abstract- Neuropsychological Rehabilitation (NR) is understood as a process of using a wide variety of strategies deliberately centered on one person, which should stimulate his/her development, or the use of available resources to obtain a good occupational performance. Concerning this point, the intervention must be understood broadly, considering people in their contexts, activities and relationships. In order to attend these principles, the key element for success in proposing an NR plan is the active use, by the rehabilitator, of a clinical formulation process (CF). Considering the infinity of possible influences on an individual's overall level of functioning, the formulation of factors is extremely useful to guide all the people involved, from the clinical team to the patient's family, in order to understand the current problems faced by the person, to delineate the intervention and to prospect for future steps. Based on what was introduced, the main objective of this study was to present this theory in a more practical way, as well as offer pragmatics tools, the NR Cycle and the Flowchart of CF for the intervention in NR for the professionals that work on this area, in order to anchor a more precise and effective practice in the NR. To conclude, a clinical case that aims to contextualize the theory is presented.

Keywords: neuropsychological rehabilitation, clinical formulation, model.

I. Introduction

Neuropsychological Rehabilitation (NR) is understood as a process of using a wide variety of strategies deliberately centered on one person, which should stimulate his/her development, or the use of available resources to obtain a good occupational performance. The intervention must be understood broadly, considering people in their contexts, activities and relationships (Prigatano 1999,

Wilson 2002). The fundamental goal is the development of a more adaptive and functional behavior set, aimed at improving quality of life, independence and autonomy (Royal et al. 2007).

According to Wilson (2002), NR is characterized by an individualized approach that identifies and pursues relevant goals for individual patients, contexts and families, and best performance in their occupations. It has as a priority the maintenance and / or development of cognitive skills and compensation for disabilities. It also integrates multimodal methods, conducted by a multidisciplinary and interdisciplinary team (health professionals, educators and all those directly and indirectly related to assistance); and interacts with the individual environment, aiming at transferring the rehabilitation program to the patients´ daily life (Kasper et al. 2015). Thus, the sine qua non condition is to rehabilitate the person, and not their neuropsychological processes (Loschiavo Alvares 2020 a).

Considering what had just been said, the key element for success in proposing an NR plan is the active use, by the rehabilitator, of a clinical formulation (CF) (Loschiavo Alvares 2020 b). This requires the application of a theory and empirical knowledge to the collected information through evaluation in order to derive hypotheses about the nature, causes and factors that influence a patient's current problems or their presentations and behavioral situations. During the formulation process, the countless possible influences on the functioning and neuropsychological status of an individual are taken into consideration.

Hypotheses about the nature, causes and factors that influence the current problems experienced by the patient are used to guide assessment and / or the offering of a rehabilitation plan (Wilson and Betteridge 2019). That being so, the clinical formulation goes beyond the diagnosis, the development of a conceptualization of the current and future clinical picture, of the etiology, mainly covering the management of the patient in the context of his or her multidimensional biopsychosociocultural domains (Loschiavo Alvares 2020 b). Considering the infinity of

Corresponding Author α: Occupational Therapist, with Double PhD in Neuroscience from the Federal University of Minas Gerais (UFMG) and from the University of Cambridge - United Kingdom. Nexus- Institute for Research, Teaching and Clinic in Neuropsychological Rehabilitation, in Belo Horizonte/Minas Gerais – BRAZIL.
e-mail: fabricia@nexusclinica.com.br
Author σ: Clinical neuropsychologist with 43 years experience in brain injury rehabilitation. She did her undergraduate degree at Reading University in the United Kingdom, her clinical training at The Institute of Psychiatry in London and her PhD at the University of London.

possible influences on an individual's overall level of functioning, the formulation of factors is extremely useful to guide all the people involved, from the clinical team to the patient's family, in order to understand the current problems faced by the person, to delineate the intervention and to prospect for future steps.

In accordance with Sperry et al. (1992), the formulation is a process of linking a group of data and information to define a coherent pattern, helping to establish the diagnosis and tracing the appropriate intervention, providing explanations, in order to prepare the rehabilitator, the patient and family for therapeutic work and goal setting. The formulation also helps to gather the results of many evaluations carried out by different team members in a single coherent source. Therefore, it requires a description of what happened to the patient and the pathology or diagnosis, covering all the functional consequences. It is also necessary to know the family and social contexts and how the person sees himself or herself before the injury or illness.

From the perspective of the NR, the CF involves the entire process of clinical structuring for intervention, including the establishment of goals, the measurement of efficacy: in short, a comprehensive flowchart, from which there is the identification of the key characteristics of the patient, the definition of the intervention´s targets, the specification of the desired results, contextual and occupationally significance, the design of the interventions, the implementation and the constant reassessment, based on functional and contextually relevant parameters. Based on what was introduced, the main objective of this study was to present this theory in a more practical way, as well as offer pragmatics tools for the professionals that work on this area, in order to anchor a more precise and effective practice in the NR.

II. The Comprehensive Model of nr for Psychiatric Disorders

In 2002, Wilson published a model of cognitive rehabilitation arguing that "Cognitive rehabilitation is a field that needs a broad theoretical base incorporating frameworks, theories, and models from a number of different areas". No one model or group of models is sufficient to address the complex problems facing people with cognitive problems consequent upon brain injury" (Wilson 2002). Models and theories influencing cognitive rehabilitation include those of cognition, assessment, recovery, behaviour, emotion, compensation and learning. Wilson synthesised these individual models and theories into a comprehensive model of cognitive rehabilitation, which has been used to plan rehabilitation programmes specifically for people with acquired brain injury (Wilson et al. 2013). As far as we know, this comprehensive model has not been employed in rehabilitation for people with psychiatric disorders, despite the fact that cognitive impairments are common in these populations and contribute to restrictions in everyday life functioning (Rosenheck 2006, Samuelson et al. 2006, Corrigan et al. 2007, Grant and Adams 2009, Bearden et al 2011, Volkow et al 2011); and based on that, in 2018, Loschiavo Alvares, Fish & Wilson expanded this model and also added the specificities related to the clinical population with neuropsychiatric disorders. This is the model proposed here, as an anchor for the entire clinical process. (see Loschiavo Alvares and Wilson (2020). It consists of four distinct sections, with topics of specific interest for each, namely: person specific considerations, condition specific factors related to the diagnosis, theoretical concerns and, finally, the patient's, family and environmental considerations.

Initially, the patient's clinical history will be required. This will consist of: the age at the beginning of the disorder; number of hospitalizations; family and developmental histories; possible substance use and risk of suicide; the impact on health condition; psychological factors and possible effects on NR (stigma, personality, experiences of failure, low self-esteem, negative beliefs and coping styles, anxiety and mood); the functional status (Loschiavo Alvares, Sediyama, Rivero et al. 2011) (by using the International Classification of Functionality - ICF and other assessments that are relevant to the case); and the Expected and Observed Cognitive Profile, which considers the neuropsychological profiles expected for each disorder, already well described in the literature and comparing them with the findings of the neuropsychological evaluation to determine cognitive strengths and weaknesses.

Diagnostic considerations would include the Pharmacological Intervention, which aims to understand the impact of pharmacotherapy on mood and cognition; also, the Biological Influences and Global Prognosis, which would include the neuroprogression and allostatic load, which, taken together, will allow the rehabilitator to note their patient's prognosis.

Theoretical concerns, the third section, on the other hand, consists of Complementary Models, the neuropsychological, behavioral, cognitive behavioral, systemic, which should use a broader understanding of the patient's context; the Scientific Approach, from which there is the postulate that NR should always be an evidence-based process, adopting, therefore, the scientific basis in the evaluation and proposition of new interventions; and the Intervention Focus (s), that helps the rehabilitator to consider the specifics of each case to determine the focus of their intervention. This last named can be one or a combination of the following: restoration of function and / or encouragement of neuroanatomical reorganization, use of residual skills more efficiently, or search for alternative paths, environmental changes.

Finally, there are considerations of the patient, family and contexts that involve the determination of instruments to evaluate the effectiveness of the intervention; the process of setting goals with the patient and family, the NR implementation and constant monitoring of its evolution with periodic reviews and updates according to evolutions, and / or new demands and functional goals that need to be stablished.
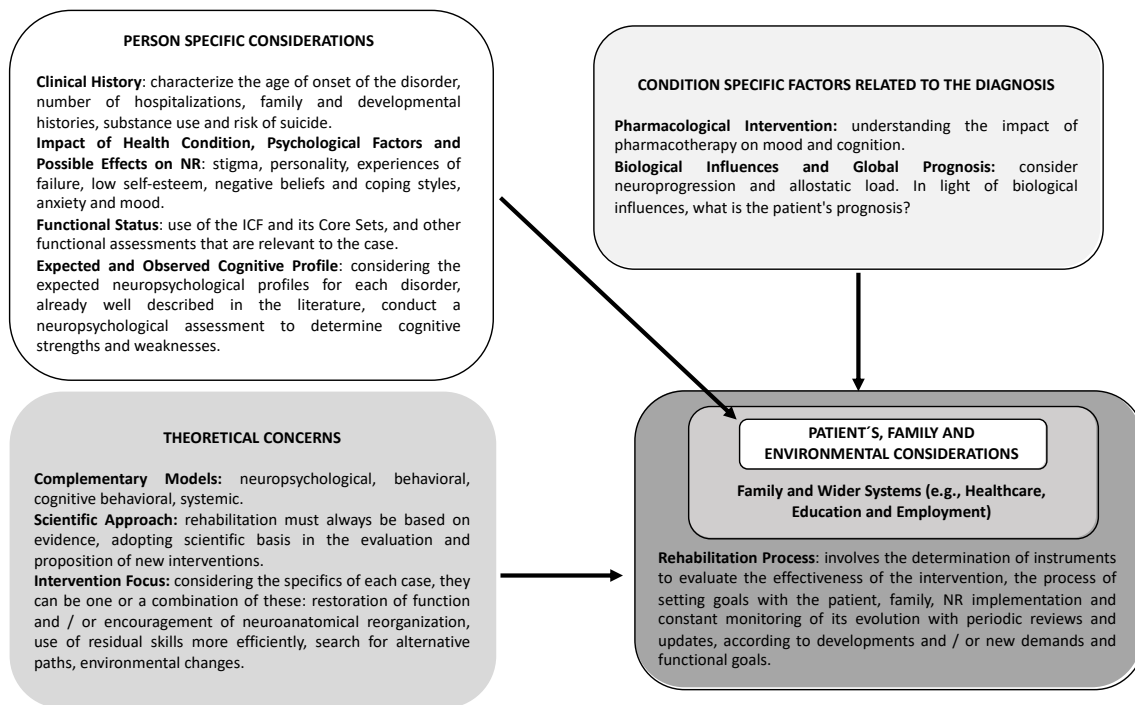

PERSON SPECIFIC CONSIDERATIONS

Clinical History: characterize the age of onset of the disorder, number of hospitalizations, family and developmental histories, substance use and risk of suicide.
Impact of Health Condition, Psychological Factors and Possible Effects on NR: stigma, personality, experiences of failure, low self-esteem, negative beliefs and coping styles, anxiety and mood.
Functional Status: use of the ICF and its Core Sets, and other functional assessments that are relevant to the case.
Expected and Observed Cognitive Profile: considering the expected neuropsychological profiles for each disorder, already well described in the literature, conduct a neuropsychological assessment to determine cognitive strengths and weaknesses.

CONDITION SPECIFIC FACTORS RELATED TO THE DIAGNOSIS

Pharmacological Intervention: understanding the impact of pharmacotherapy on mood and cognition.
Biological Influences and Global Prognosis: consider neuroprogression and allostatic load. In light of biological influences, what is the patient's prognosis?

THEORETICAL CONCERNS

Complementary Models: neuropsychological, behavioral, cognitive behavioral, systemic.
Scientific Approach: rehabilitation must always be based on evidence, adopting scientific basis in the evaluation and proposition of new interventions.
Intervention Focus: considering the specifics of each case, they can be one or a combination of these: restoration of function and / or encouragement of neuroanatomical reorganization, use of residual skills more efficiently, search for alternative paths, environmental changes.

PATIENT´S, FAMILY AND ENVIRONMENTAL CONSIDERATIONS

Family and Wider Systems (e.g., Healthcare, Education and Employment)

Rehabilitation Process: involves the determination of instruments to evaluate the effectiveness of the intervention, the process of setting goals with the patient, family, NR implementation and constant monitoring of its evolution with periodic reviews and updates, according to developments and / or new demands and functional goals.

Figure 1: The Neuropsychological Rehabilitation Model proposed by Loschiavo Alvares and Wilson (2020), Loschiavo Alvares, Fish and Wilson (2018).

An extension to the model has been proposed by Loschiavo Alvares, (see Fig 2) which reflects the synergy and intersection of the components of the sections of the above model. This cycle was idealized and outlined as an intermediate tool, in the sense of being the empirical translation of the Loschiavo Alvares & Wilson´s (2020) model. Thus, the cycle brings a structured approach regarding the management of rehabilitation, which includes all tasks, from the analysis and identification of problems, demands for the NR, to the measurement of the effectiveness of the intervention, involving the patient, family and contexts on the clinical decision-making.

It also brings, in its essence, the dynamic and interactive proposal of all the based components of the Comprehensive Model of Neuropsychological Rehabilitation by Loschiavo Alvares & Wilson (2020), according to the four sections mentioned before, which are represented by the small gears, as captioned in the upper left corner of the figure. Thus, each component of this model is synergistically associated with others and makes up each step of the NR cycle. See figure 2.
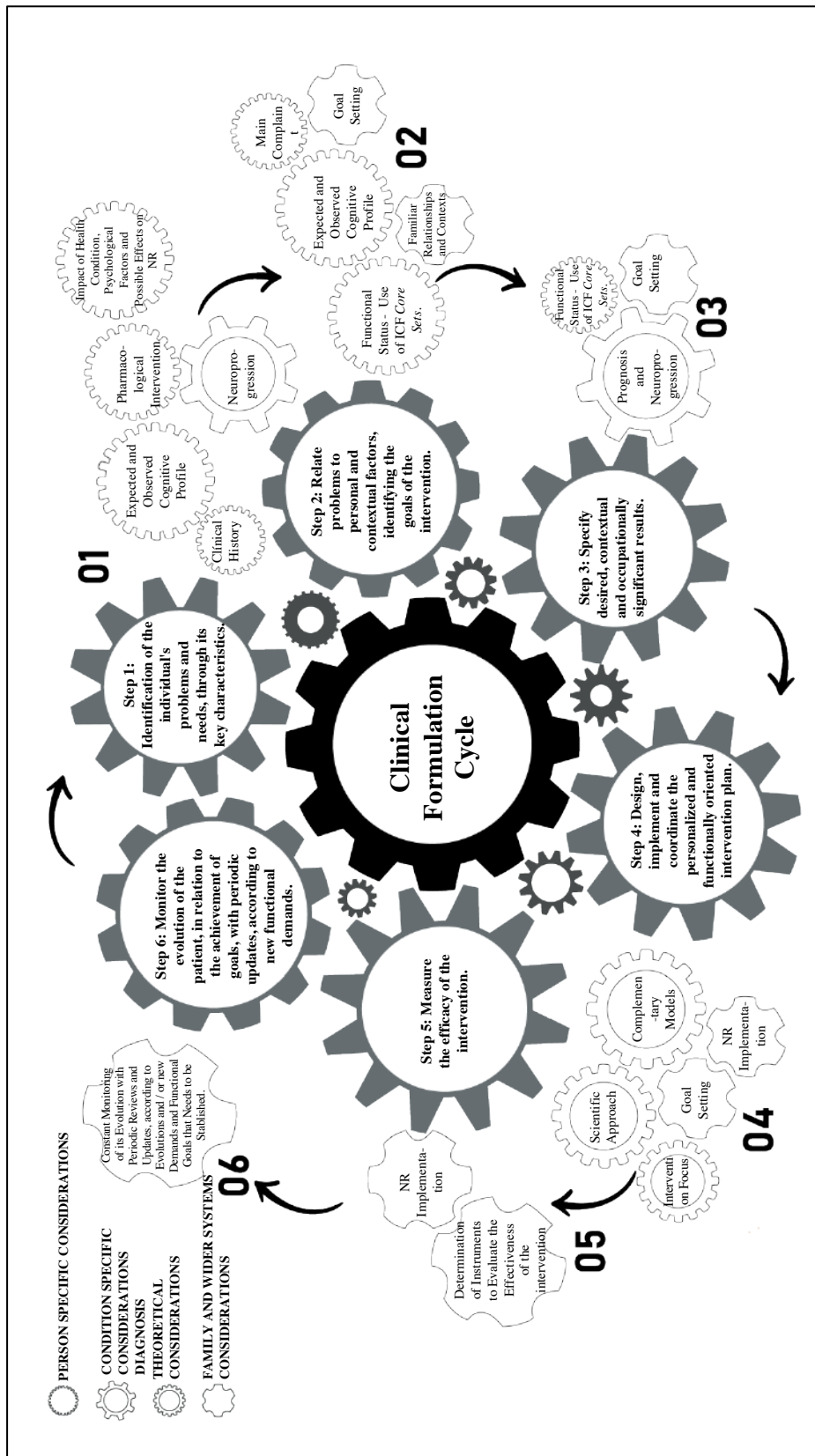
Figure 2: The NR Clinical Formulation Cycle

In fact, there is no "cake recipe" to be followed for the conduct of NR, but it is possible to draw coordinates so that we may have guidelines and an initial route to follow, emphasizing that the collateral routes will always be determined by the patient, with his or her own history, individuality and unique characteristics. Finally, when we get there, how can we then utilize the postulates of the Neuropsychological Rehabilitation Model, by Loschiavo Alvares & Wilson (2020)? How do we employ the whole framework built up to this point as a guiding principle?

The answer is by using the cycle above as a practical tool, in the sense of being the empirical translation of the NR model. Thus, the cycle brings a structured approach regarding rehabilitation management, which includes all tasks, from the analysis and identification of problems, demands for the NR, to the measurement of the effectiveness of the intervention, involving the patient, family and contexts in the clinical decision making.

It also comprises, in its essence, the dynamic, interactive and synergistic proposal of all the basic components, which until then were presented in a fragmented way only as a didactic resource, ranging from the clinical formulation to the intervention in NR. The cycle consists of six steps, that is, its coordinates for the clinical formulation for NR, namely:

- Step 1: Identification of the individual's problems and needs, through its key characteristics.
- Step 2: Relating problems to personal and contextual factors, identifying the goals of the intervention.
- Step 3: Specifying desired, contextual and occupationally significant results.
- Step 4: Designing, implementing and coordinating the personalized and functionally oriented intervention plan.
- Step 5: Measuring the efficacy of the intervention.
- Step 6: Monitoring the evolution of the patient, in relation to the achievement of goals, with periodic updates, according to new functional demands.

What about the range of each coordinate? What are the guidelines? For each step, there is a path composed of the components of the Rehabilitation Model and in order to build it in a more tangible way, in order to build the methodology so that the rehabilitator, fully understands it, follow Table 1 below: this Table demonstrates the intersections between the coordinates, the steps of the rehabilitation cycle, and the guidelines, being the components of the NR Model (Loschiavo Alvares & Wilson 2020).

Table 1: The intersections between the steps of the NR Cycle - the Coordinates - and the components of the NR Model - the Guidelines

COORDINATES X GUIDELINESS	THE NR MODEL COMPONENTS			
STEPS OF THE NR CYCLE	PERSON SPECIFIC CONSIDERATIONS	CONDITION SPECIFIC CONSIDERATIONS DIAGNOSIS	THEORETICAL CONSIDERATIONS	FAMILY AND WIDER SYSTEMS CONSIDERATIONS
Step 1: Identification of the individual's problems and needs, through its key characteristics.	Clinical history; Impact of Health Condition, Psychological Factors and Possible Effects on NR.	Pharmacological Intervention; Biological Influences and Neuroprogression.	-	-
Step 2: Relate problems to personal and contextual factors, identifying the goals of the intervention.	Expected and Observed Cognitive Profile.	-	-	Main Complaints: Goal Setting and Familiar Relationships and Contexts.
Step 3: Specify desired, contextual and occupationally significant results.	Funcional Status	General Prognosis - Biological Influences / Neuroprogression.	-	Goal Setting.
Step 4: Design, implement and coordinate the personalized and functionally oriented intervention plan.	-	-	Complementary Models; Scientific Approach and Intervention Focus.	Goal Setting and NR Implementation.
Step 5: Measure the efficacy of the intervention.	-	-	-	NR Implementation; Determination of Instruments to Evaluate the Effectiveness of the intervention .
Step 6: Monitor the evolution of the patient, in relation to the achievement of goals, with periodic updates, according to new functional demands.	-	-	-	NR Implementation; Constant Monitoring of its Evolution with Periodic Reviews and Updates, according to Evolutions and / or new Demands and Functional Goals that Needs to be Stablished.

And in order to clinically employ the rehabilitator, based on all the theoretical assumptions presented here, the following flowchart (Figure 3) is proposed for the proposition of an NR plan, leaving it as a methodological reference for the translation of the theory into practice in NR intervention, emphasizing that the same can be applied to cases of both acquired brain injuries, as well as neuro developmental and psychiatric disorders.
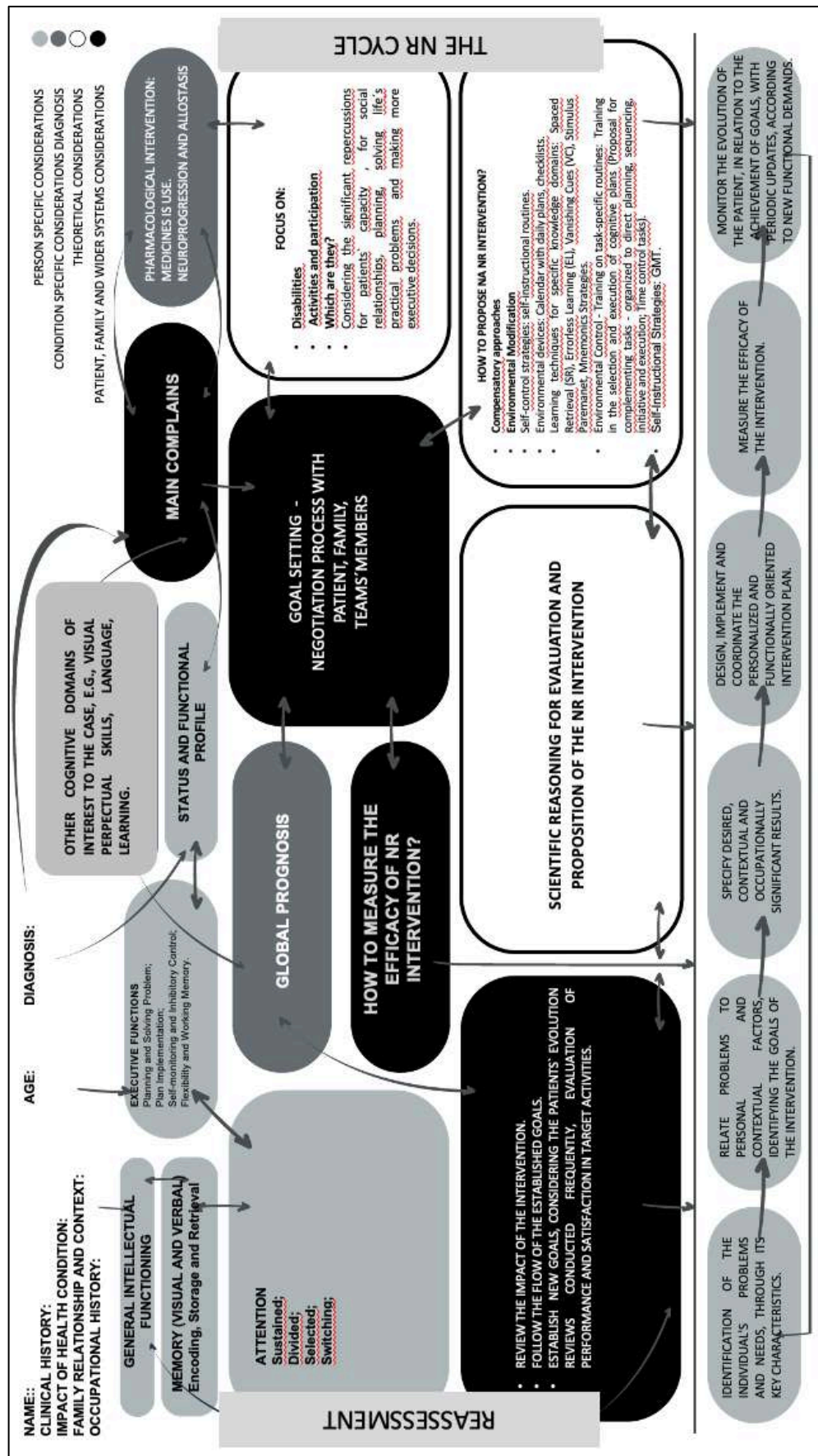

Figure 3: Flowchart of clinical formulation for the intervention in NR (Loschiavo Alvares & Wilson 2020)

How to Apply the Flow Chart of CF? A Summary of a Clinical Case

Considering all presented above and aiming to demonstrate how to gather all this information together, we describe a clinical case.

P.G., Woman, 52 years old, retired, diagnosed with bipolar disorder type I, since she was 23. Concerning her clinical history, there were in total 21 suicidal attempts, and the last one was in 2010, when a piercing-blunt wound was self-inflicted in the orbitofrontal cortex bilaterally. Subsequently, about 30 days after this event, as the self-aggressive behaviors persisted, a bilateral tonsillectomy was conducted.

According to a familiar informant, the patient has shown a slower functioning, difficulties of concentrating, is unable to tackle an activity to the end, is unable to organize and sequence her daily tasks. "She is paralyzed, does not engage in any goal, she wants, she feels, she does, without any planning", her mother said. "My memory is over. I no longer remember anything," P.G. reinforced.

The analysis of the pattern of adaptive difficulties faced by P.G. does not suggest any substantial qualitative change, when comparing her situation prior to brain injury with the current situation. The differences are more of an intensity. In summary, the results from the neuropsychological assessment have shown dissociation between the functions of circuits related to the prefrontal cortex dorsolateral, which were the prefrontal cortex ventromedial. Considering the tasks related to contextualized cognition, P.G. also presented a characteristic pattern of impairment regarding the lack of monitoring, impulsivity, myopia for the future, difficulties in anticipating the consequences of her own behavior, cognitive-behavioral dissociation, difficulty in making inferences and integrating implicit non-verbal information, and finally, explicit deficits regarding the decision-making process.

Aiming to connect the information from the cognitive deficits up to the strategies of intervention, table 2 is presented below.

Table 2: The big picture of P.G.´s case

COGNITIVE FUNCTIONS	COGNITIVE DEFICITS	OCCUPATIONAL'S IMPAIRMENTS: PATIENT AND FAMILY'S MAIN COMPLAINS	INTERVENTION'S GOALS	STRATEGIES OF INTERVENTION
Attention and Memory	• Low resistance to distracting stimuli, attention difficulties.	• She has difficults in learning. She can not retain new content, e.g. studies of the new language and postgraduate subjects.	• Improve her capacity of learning new contents in 75%.	• Self-control strategies: self-instructional routines. • Environmental devices: Calendar with daily schedules, checklists. • Techniques for learning specific knowledge domains: spaced retrival, errorless training and vanishing cues.
Executive Functions	• Impulsivity • Difficulties in planning - sequencing, organization, decision making, time management and problem solving.	• She has difficulties in sustaining her behaviour, for example, she has problems in maintain a proper conversation (she can not tackle new things, e.g., a subject to the end); • She is unable to organize herself and proceed with the activities, so she does not perform any instrumental activities of daily living (IADL), she does not cook. • She can not complete a new multi-step tasks such as: paying bills using the internet banking, managing Uber App, doing her translations for the charity she is a volunteer. Concerning this last point, P.G. Works as a volunteer in a charity that supports women in a risk situation. She is responsible for translating texts from English to Portuguese language, which are part of its website	• Improve her ability the to hold a conversation in 75%. • Organize herself for the performance of activities in the target contexts, such as preparing a simple meal. • Develop strategies for: • managing the internet banking (paying bills monthly) and UBER App (be able to use this app for her locomotion around the city), • Proceed with the translations for the charity she is a volunteer, without the assistance of her mother.	• Environmental control • Training on task-specific routines • Training in the selection and execution of cognitive plans (Proposal for complementing tasks - organized to direct planning, sequencing, initiative and execution; Time control tasks) • Self-instructional therapy, e.g. Goal Management Training (GMT).

III. Final Considerations

The main pillar for conducting a NR program is the process of clinical formulation as shown in figure 2. It is the master cog that makes all the other components integrate in a synergistic and orchestrated way. It is up to the rehabilitator, that is the one who, regardless of their basic graduation, health, education and professionalism, will perform in NR, the construction and sedimentation of this process so that the intervention is anchored on a solid, scientifically supported and functionally significant basis, indispensable prerequisites for therapeutic success. In this way, the professional /clinician is the best researcher and the converse is also true. Seeing the patient as a research project implies globally analyzing the case and all the variables involved, from the component to the function and vice versa, establishing hypotheses and goals, setting short, medium and long-term objectives, defining the most appropriate intervention with the selection of the most pertinent strategies, and analyzing its impact, using objective methods for evaluating effectiveness. The entire NR process must be parameterized by factors with functional ballast.

Considering the evidence-based practice, it is up to the professional to always use the scientific evidence available in the literature to select the most appropriate intervention (Ward, 2003), supporting their clinical reasoning with the single and greatest objective of promoting the functionality of the patient. This process of reflecting, planning, guiding and conducting treatment, requires the therapist to employ a metacognitive analysis, that is, the ability to think and reflect on the clinical decision making process, hence, reasoning, applied to a given situation. In this way, therapeutic actions will always be properly oriented to meet the interests and goals of the patient and the family in the NR process.

Aligned to what was presented above, the clinical formulation process as proposed here, is like a compass, through which the rehabilitator will have all the coordinates and guidelines to outline the intervention plan for his/ her patient, at the same time that he will find, from our flowchart, all the parameters to change this plan, according to the new demands, in a flexible and functionally oriented way.

References Références Referencias

1. Bearden CE, Shih VH, Green MF, Gitlin M, Sokolski KN, Levander E, et al. (2011). The impact of neurocognitive impairment on occupational recovery of clinically stable patients with bipolar disorder: a prospective study. *Bipolar Disorder* 13, 323-333.
2. Corrigan PW, Mueser KT, Drake RE, Solomon P (2007). *The Principles and Practice of Psychiatric Rehabilitation: An Empirical Approach*. Guilford, New York.
3. Grant I, Adams KM (2009). *Neuropsychological assessment of neuropsychiatric and neuromedical disorders*. 3rd ed. Oxford University Press, New York.
4. Kasper E, Ochmann S, Hoffmann W. et al. (2015). Cognitive rehabilitation in Alzheimer's disease – a conceptual and methodological review. *J Prev Alzheimers Dis* 2, 142- 152.
5. Loschiavo Alvares FQ, Sediyama CYN, Rivero TS, et al (2011). Tools for efficacy's assessment of neuropsychological rehabilitation programs. *Clinical Neuropsychiatry* 8, 3, 1-11.
6. Loschiavo Alvares FQ, Fish J, Wilson BA (2018). Applying the comprehensive model of neuropsychological rehabilitation to people with psychiatric conditions. *Clinical Neuropsychiatry* 15, 2, 83-93.
7. Loschiavo Alvares FQ, Wilson BA (2020). *Reabilitação Neuropsicológica nos Transtornos Psiquiátricos – da teoria à prática.* Editora Artesã, Belo Horizonte.
8. Loschiavo Alvares FQ (2020 a). *Manual para a Aplicação dos Core Sets da Classificação Internacional de Funcionalidade (CIF) na Reabilitação Neuropsicológica dos Transtornos Psiquiátricos*. Editora Artesã, Belo Horizonte.
9. Loschiavo Alvares FQ (2020 b). *Manual para a Formulação Clínica para a Intervenção em Reabilitação Neuropsicológica*. Editora Artesã, Belo Horizonte.
10. PRIGATANO G (1999). *Principles of neuropsychological rehabilitation*. Oxford University Press, New York.
11. Rosenheck R (2006). Barriers to Employment for People with Schizophrenia. *American Journal of Psychiatry* 163, 411- 417.
12. Royall DR, Lauterbach EC, Kaufer D, et al (2007). The Cognitive Correlates of Functional Status: A Review from the Committee on Research of the American Neuropsychiatric Association. *Journal of Neuropsychiatry Clinical Neuroscience* 19, 3.
13. Samuelson KW, Metzler TJ, Rothlind J, Choucroun G, Neylan TC, Lenoci M, et al. (2006). Neuropsychological Functioning in Posttraumatic Stress Disorder and Alcohol Abuse. *Neuropsychology* 20, 716-726.
14. Sperry L, Gudeman J, Blackwell B, et al (1992). *Psychiatric case formulations.* American Psychiatric Press, Washington, DC.
15. Volkow ND, Baler RD, Goldstein RZ (2011). Addiction: pulling at the neural threads of social behaviors. *Neuron* 69, 599-602.
16. Ward JD (2003). The nature of clinical reasoning eith groups: a phenomenological study of an occupational therapist in community mental health.

The American Journal of Occupational Therapy 57, 8, 625-634.

17. Wilson BA, Betteridge S (2019). *Essentials of Neuropsychological Rehabilitation.* Guilford Press, New York.

18. Wilson BA (2002). Toward a comprehensive model of cognitive rehabilitation. *Neuropsychological Rehabilitation* 12, 97- 110.

19. Wilson BA, Ashworth F, Winegardner J (2013). Neuropsychological Rehabilitation after Traumatic Brain Injury: Two case studies. In: Muenchberger H, Kendall E, Wright J, editors. *Health and Healing after traumatic brain injury*. Praeger Press Westport CT, USA, p. 169-186.