Restorative Neurology and Neuroscience 21 (2003) 283-314
IOS Press


# Friday 27 February 2004

## Plenary lecture

**27A1**

**Compensatory mechanisms and motor functions of the basal ganglia: lessons from Parkinson´s disease**

Jose A. Obeso
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The revitalization of surgery for Parkinson´s disease (PD) has provided new opportunities to examine the effects of focal lesion of the basal ganglia and the adequacy of current pathophysiological concepts. Modern studies have shown that pallidotomy in Parkison´s disease(PD) induces significant improvement of movement parameters, restores thalamo-cortical activity and eliminates levodopa-induced dyskinesias without causing any major deficit of movement control. In patients with hemichorea-ballism or dystonia, pallidotomy also induce marked amelioration of the dyskinesias with no associated deficit. Lesion of the subthalamic nucleus(STN) in PD is also associated with marked motor benefit. Subthalamotomy may produce hemichorea.ballism in many patients but this is usually self-resolving over a few days or weeks. Thus, there is a spontaneous resolution of the dyskinesias. In a few patients, the hemiballism may be severe and long-lasting. In such cases, as it is well known from the experimental literature in the 40´and 50´s, a subsequent pallidotomy will eliminate the hemiballism without loosing the antiparkinsonian benefit. Such patients, who are literally deprived of basal ganglia output in one hemisphere appear to perform remarkably well.. On the other hand, bilateral surgery of the basal ganglia is usually associated with important side effects. In addition, striatal dopamine depletion has to surpass over 90%(in the MPTP intracarotid injection model) in order to produce parkinsonian symptoms but much milder (i.e. 50%) bilateral depletion causes clinically relevant motor symptoms in PD. I conclude by suggesting that unilateral disruption of the basal ganglia is tolerated very well by the primate brain. This may be understood as a result of the distributive and bilateral distribution of the motor system, which does not depend upon unilateral BG output activity to perform motor routines indicating the importance of the BG-frontal cortex loops in guiding movement and behavior.

## From Basic Neuroscience to clinical practice

**27A2**

**The role of progesterone and related neurosteroids in the treatment of traumatic brain injury and stroke**

Donald G. Stein
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We are now examining the role of progesterone's precursors and metabolites to determine their' specific mechanisms of action in the damaged central nervous system. We are also testing patients in an NIH sponsored, Phase II (a), single-center trial for safety and efficacy. The functional, physiological and genomic mechanisms underlying progesterone's beneficial effects and still being discovered and some of the newer findings will be described as a part of the presentation. There is now increasing, experimental evidence that this neurosteroid can play a role in reducing immune inflammatory disorders of the brain as well as providing benefits to the victims of stroke. We are currently examining these injury models in both laboratory rats and mice. In laboratory animals, females with traumatic brain injury have better functional and morphological outcomes than males with the same extent of injury. Naturally occurring levels of progesterone in females appear to mediate these beneficial effects. Treatment with exogenous progesterone in both adult males and females will lead to better outcomes after traumatic brain injury. The beneficial effects of progesterone treatment are related to its ability to reduce post-injury cerebral edema caused by the cytotoxic cascade caused by the trauma. Progesterone and its constituents act by reducing immune-inflammatory reactions, membrane lipid peroxidation, apoptosis and necrosis. Progesterone and it's metabolite, allopregnanolone, stimulate remelination of damaged axons and enhance regeneration. Phase IIa trial with progesterone sponsored by the U.S. National Institutes of Health is currently being conducted.

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**27A3**

**The growth of the Hebb Synapse: Evidence from the hippocampus**

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Since the time of Cajal it has been thought that learning leads to an input-dependent neuronal growth process. The extent of growth of new synaptic connections has been speculated to be directly related to the long-lasting nature of the memory for that learning experience. Here we test this hypothesis by focusing on one particular synaptic junction, the mossy fiber –CA3 pyramidal cell synapse in the stratum lucidum of the hippocampus, which is known to process information that is critical for long-term memory. Initial evidence from this and other laboratories indicates that new growth has occurred such that ectopic mossy fibers are present in the stratum oriens. But this growth only occurs with overtraining. Why does new growth require overtraining, not simply training, to propel the apparent formation of new synapses formed consequent to spatial learning? A general framework for a specific answer may be in the formation of duplicate traces as initially proposed by Hebb. According to this view, the long-lasting nature of the memory trace depends on the formation of multiple representations of that trace. This implies that the mossy fiber system could be part of the network that represents the memory, or more accurately, a facet of the attributes of memory. A provisional working hypothesis is that learning begins the process of mossy fiber growth and that such growth provides the development of new circuits that overtraining activate, which in turn allow for reduplication of traces, involving mossy fibers in part, which are necessary for the long-term storage of information. Thus, available evidence on mossy fiber growth in rats makes it attractive to think that enhanced learning after overtraining may be both a consequence and a cause of the growth of mossy fibers. One overarching long-term goal of this research is to specify the molecular determinants of this learning-induced growth. The readily identifiable characteristic features of the presynaptic and postsynaptic elements make them ideal for studying the role of growth proteins and their regulatory kinases. By using this tractable model, the proposed research provides the infrastructure to determine whether training-induced mossy fiber growth represents a specific instance of a more general event that occurs after learning in key memory storage locations throughout the brain.

**27A4**

**The 'emotive brain', the noradrenergic system and functional plasticity**

Susan J. Sara
*University of Paris 6, Paris, France*

Motivation and attention can have a profound influence on perception, learning and memory. Neuromodulatory systems, especially the noradrenergic (NE) system, covary with psychological states to modulate cortical arousal, influence sensory processing and promote synaptic plasticity. There is even some suggestion that the NE system might facilitate functional recovery after brain damage. Post-synaptic effects of NE in its ubiquitous projection regions have been well-studied, but factors controlling activation of NE neurons are less known.The pontine nucleus Locus Coeruleus (LC) contains the entire population of NE neurons projecting to the forebrain and all cortical and thalamic regions receive NE input. Using single unit recording in freely moving rats, we have been studying neuroanatomical circuits, along with sensory stimuli within their cognitive contexts that control LC firing. Rats are implanted with movable microelecrodes to record activity during a variety of behavioral situations: exploration of novelty in a hole-board, response to tones or odors that predict reward or absence of reward, extinction or reversal of stimulus-reward association. We find that LC-NE neurons respond to novel or salient stimuli, habituate rapidly to respond anew when the stimulus is associated with reward (CS+), particularly in the early stage of learning. Recent experiments suggest that these responses are more related to reward expectancy than to the CS+. Importantly, there is robust LC response to any change in the predictive value of the stimulus, i.e. when new learning must occur. NE released by LC activation will promote the underlying synaptic plasticity.

**27A5**

**Neuroplasticity and depressive disorders. Efficacy of tianeptine**

Clara Lucia Abreu de la Torre, Jorge Bergado Rosado, Eduardo Alvarez González, Carlos Suárez Monteagudo, Rene Macias Betancourt, Roidel Alessandrini González, Rolando Palmero Camejo
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Introduction: Depressive disorders have a prevalence of 15-20% in the general population. The rate of depression in cerebro-vascular disease (CVD) increase

to 30 and 50% Recovery of affected functions depend mostly on neuroplastic mechanisms which can be enhanced by therapeutic interventions. Recent evidence has indicated that neural plasticity depends on affective factors, which modulate its strength and duration. It is therefore important to correct depressive disorders in patients under rehabilitation treatment. Objective. To evaluate the efficacy of different antidepressive in CVD patients under treatment in our clinic. Method. The severity of depression was evaluated using the Hamilton Scale for Depression before and after conclusion of the therapeutic program. Antidepressive therapy with tianeptine (25 mg, average dose) was introduced in a group of 30 patients, which were previously without medication. Other patients under antidepressive treatment continue using the same drugs and dose. Results: Tianeptine revealed to be the most effective drug considering the improvement in their affective condition, the better results in rehabilitation and the reduced side effects.

**27A6**

**Redefining the self after neurological insult**

Robert D. Voogt
*Robert Voogt & Associates, Inc., Virginia Beach, Virginia, USA*

For almost 10,000 years, the medical community has been involved in the understanding of the human nervous system. The most devastating aspect of neurological insult is the historical loss of who the individual was. Whether it is an alteration in how one ambulates or the ability to interact and be a part of the community, these changes require a redefinition of the self. Throughout the ages, literature and the arts have portrayed the progression from ancient medicine and healing to modern scientific technology. Seeking cures through medicine and potions was seen as early as 2100 B.C. Our success at controlling nature has created a world of disabilities because of much higher survival rates. We struggle every day to defy mortality and end up failing and living with people who are handicapped. They remain handicapped because the environment and community around them have failed to integrate them. In fact, the community often seeks to shut them out and reject them as less than able. Both, the community of abled and those disabled, lose.The goal of 21st century medicine must be more than the desire to control nature. It must unite the healer with those in need of healing and mend the relationship between patient, healer and the community. This presentation takes a historical look at the healing process and healing profession in an attempt to define the absolute goal in neurological rehabilitation.

## Institutional and social aspects of neurological restoration

**27A7**

**Cognitive and behavioral rehabilitation of children and adolescents with traumatic brain injury**

Mark Ylvisaker
*College of Saint Rose, Albany, New York, USA*

Cognitive impairments and associated problems with communication, behavioral self-regulation, and academic performance are among the most common consequences of traumatic brain injury in children and adolescents. For families and teachers, the behavioral consequences of TBI tend to be most problematic. Attempts to restore isolated cognitive functions with discrete trial cognitive training exercises have yielded disappointing results in both children and adults with TBI. Similarly, attempts to improve behavioral regulation with traditional contingency management behavior modification strategies have yielded disappointing results with this population. I will briefly review alternative approaches to cognitive rehabilitation and behavior management, and describe a context-sensitive and support-oriented approach that is consistent with the neuropsychological profiles of many children and adolescents with TBI. Study Purpose: to test the effectiveness of a combined cognitive, behavioral, and executive function intervention, delivered within school settings and the academic curriculum; The intervention highlighted context supports (e.g., supportive interactive style of education staff) as well as compensatory strategies and general executive function routines for the child. Study Methods: single subject experimental methodology was used to test the intervention with young children and adolescents. Study Results: In each case, the intervention resulted in a reduction of negative behaviors and an increase in school work completed. Furthermore, the intervention was judged to be easily delivered within the context of everyday school routines.

**27A8**

**Cognitive Rehabilitation Outcomes for Traumatic Brain Injury – Evidence Report Update**

Nancy Carney[a], Hugo du Coudray[a,b]

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In 1998 the Evidence-Based Practice Center (EPC) of Oregon Health & Science University (OHSU) conducted a systematic review of the scientific literature about the effectiveness of cognitive rehabilitation for the treatment of traumatic brain injury (TBI) in adults. In 2002 we updated that report. We conducted an electronic search of MEDLINE, PsychINFO, CINAHL, and the Cochrane Controlled Trials Register to capture literature from 1998 to 2002. We sought randomized controlled trials, non-randomized comparative trials, and systematic reviews. Publications were excluded in which samples included non-trauma brain injury and did not distinguish data for those patients from data for patients with TBI. Of 1,904 abstracts, and 24 additional references provided by peers, 9 publications met the inclusion criteria and were abstracted for evidence. In this presentation we will discuss the findings from the update, and will compare the quality of the literature generated between 1998 and 2002 with that of the previous evidence report.

**27A9**

**The Brain Injury Day Treatment Program (BIDTP)**

Virginia Balbona[a], John Sass[b]

[a]*Department of Rehabilitaion Medicine, Emory University, Atlanta, Georgia, USA,* [b]*Restore Neurobehavioral Center, Roswell, Georgia, USA*

Patients who have suffered traumatic brain injury (TBI) are participating in an intense program that considers their cognitive, social/emotional, and vocational rehabilitation. This innovative program based on the work of Yehuda Ben-Yishay, Ph.D. consists of an Initial Comprehensive Evaluation during which the patient undergoes a neuropsychological assessment. The evaluation reveals what cognitive deficits the patient may have as a result of their TBI and which skills have remained intact. The First Phase of the program (The Intensive Remedial Treatment) involves daily Orientation, Interpersonal Communication Skills, Cognitive Remedial Training, and Community Meeting Classes. Weekly Multiple Family Group sessions are attended by all the patient's significant others and the staff. The patient and family/significant others also receive counseling on a weekly basis. Twice during the program, the patient prepares, writes and rehearses a presentation given before an audience of guests and significant others. The presentations are videotaped and used as a tool to learn communication skills. The Second Phase of the program (The Guided Work Trials) transfers what the patient has learned in the remedial phase to a less structured environment. The goal is to discover the patients' potential for returning to work. Patients receive personal and/or small-group counseling. They receive guidance in areas that encourage independent living and performing activities of daily living. The Third Phase of the program (Post-Discharge, Maintenance/Follow-up Therapy) aims at helping the patient find work in the community and following their progress.

**27A10**

**Cross-cultural analysis of predictors of outcome from traumatic brain injury: an Argentina/United States collaboration**

Nancy Carney

*Department of Medical Informatics and Clinical Epidemiology, Oregon Health & Science University, Portland, Oregon, USA*

In 1998 researchers from Oregon Health & Science University (OHSU) initiated a prospective observational study of traumatic brain injury (TBI). They established a system to collect data about patients with TBI spanning field transport, emergency department, intensive care unit, and hospital ward, and extending to post-discharge and long-term functional outcome measures. The objective was to compare outcomes for patients who received rehabilitation with those who did not. The investigators developed complex acute care measures of severity to improve their ability to associate severity with outcome, in order to control for the influence of this variable on outcome. In 2000 this group formed a collaboration with physicians from the Neurocritical Care Group of Sociodad de Argentina Terapia Intensiva (SATI) to initiate a similar study in Argentina, where rehabilitation for TBI is rare. There are 105 patients in the Oregon dataset and 278 in the Argentine dataset. In this conference we will present initial findings from these studies. We will compare treatment and outcomes for TBI patients between the two samples, and will present results of our analysis of predictors of outcome within and between both populations.

**27A11**

**Latin-American Brain Injury Consortium. A brief presentation**

Caridad Soler Morejón
*Cuban Section of Neurointensivism. National Council of Scientific Societies, Cuba*

The Latin-American Brain Injury consortium is a free association of Latin-American professionals, dedicated to the attention of brain damaged patients. This non lucrative organization was founded last month in Rosario, Argentina, and up to now, it joins medical doctors from 11 Latin-American countries, including Cuba. The main objectives are the following: 1) To promote the training of professionals who assist patients with brain injury, (courses, and meetings). 2)To promote and address researches for the improvement of the outcome of adult and pediatric patients suffering acute brain injury. 3) To establish close collaboration between centers and researchers in Latin America, for the management of brain trauma and other acute brain diseases. 4) To negotiate and participate with the sponsors of the researches to assure the excellence in design, conduction, analysis, and publication of essays and researches. 5) To act as a supervisor in theoretical and practical aspects related with the different studies. 6) To promote the diffusion of Guidelines for the management of different brain acute diseases. 7) To promote the cooperation with other consortiums or Brain Injury Groups from our region and other countries. Finally, our purpose is to present the goals and possibilities for the integrative and collaborative work that this organization could mean to our countries in order to achieve the better prognosis for our patients. Scientific researches and training are the most important tasks focused in this program.

## Posters

**27P1**

**Strategy for communication and integral attention in the service to the neurologic patient. CIREN's experience**

Rosa María Medina, Víctor Manuel González, María del Pilar Vilá, Farah María Paredes, Juan Miguel Avellanet
*International Center for Neurological Restoration (CIREN), Havana, Cuba*

A patient, who decides to receive most adequate medical and rehabilitation services in another country, needs to find well-structured programs with communicative actions and an integral attention to fill the gap for his/her habitual environment. CIREN's staff - inspired in the characteristics of the Cuban health and social systems - offer love and human warmth to contribute to the fulfillment of objectives for the patient's Neurological Restoration Program, for a safer and more pleasurable stay. This facilitates his/her recovery – which can also become a means of promotion. This issue is verified through different and systematic tools to know the patient's own satisfaction and to perfect the quality of offered services. Some results were: between 85% to 93% valued as suitable and pleasant the following communication actions as: reception and welcoming, transfer, information, attention, invoicing, visas, and other services pertaining to International Relations. An internal investigation of its staff on optimum communicational capacity showed 80%. More than 60% of incomes are the result of recommendations from relatives, friends, neurologists and others who know about this original and successful therapeutic experience. More than 35% are re-entering, and an 83% formulate notable differences as compared to other institutions; between a 98% and a 100% consider excellent the quality of diagnosis, the physician's work, as well as efficacy of physical therapy and nursing personnel. More than a 95% express their desire to come back and to recommended CIREN to others "because the attention and medical service are the best we have ever received".

**27P2**

**Process for Quality Certification of Work Groups as an Strategy of CIREN's management System**

C. Vázquez, B. Castro, M. Peña, E. Cabrera
*International Center for Neurological Restoration, Havana, Cuba*

Quality is to achieve the user's satisfaction. Quality Management is an institutional organization that influences all technical and non-technical activities that take place within the institution. Since l994, CIREN has a Quality System where each group, department or clinic, uses a Manual of Norms and Procedures, along with a Plan for Quality Protection. This strategy has permitted us, for two years, to achieve a documentary organization within the quality process, and since 2002, we started to work on the design and implementation of the Quality Management System according to established requisites at NC ISO 9001:2000 "Requisites of the Quality Management System". In order to guarantee all this process, we have designed a Quality Certification Procedure for all work groups, whose objectives are: to establish the methodology for Evaluation and Certification of

the Quality in the integral work of all groups, and consequently, to achieve greater efficacy and quality in the services offered to the patients. This descriptive study is based on data of variables, obtained through Inspections for Certifications of Work Groups, and more comprehensive Integral Inspections expressing the quantitative and qualitative results.

**27P3**

**Use of informatics as a strategy for communication in the relation with the neurological patients: website**

María del Pilar Vilá Cienfuegos, Mayra Llanes Govín, Víctor Manuel González Albear, Juan Miguel Morales Oliva, Emilio Villa Acosta, Elías Valdés Llanes, Martha Cristófol Corominas
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We performed a revision on the Theory of Information and its relation with the sciences of Social Communication, strategies and objectives. This issue is a link to work strategies at a health institution where services offered to neurological patients. The three types of necessary information for this type of patient as to most important moments for him-her to pass through in relation to the institution are as follows: search for updated information to request medical attention, establishing a communication link with the institution while he-she receives attention there, and maintenance of a communicative link with the attention center for the patient to know about scientific advances and the introduction of new technologies that may take place at any moment in relation to his-her needs. All the above mentioned is linked to the established design for the center's website in order to take at advantage of its capacity for diffusion of the type of informatics tool in the satisfaction of relation that the center may have with all neurological patients interested in this type of attention. After a necessary analysis and the discussion on the contents of our work, we got to conclusions as to its usefulness and therefore recommendations are made as to its importance for professionals linked to this issue.

**27P4**

**Community-Based Cognitive Rehabilitation of TBI patients**

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This program intends to provide long-term cognitive rehabilitation services to patients with TBI after discharge of the hospital which final goal were the employment or social insertion of them. Cognitive rehabilitation is a set of therapies used to help improve damaged intellectual, perceptual, psychomotor and behavioral skills and usually is offered only at the hospital environment. The program has three phases: 1st relaxation or general preparation (are stimulated activities to reduce stress and tension, relaxation, artistic skills, games, hydrotherapy, music and physical exercises). 2nd stimulation of cognitive functions (Exercises of Attention, Memory, Thinking and Calculus are structured on four levels of complexity). 3rd stabilization of the cognitive outcomes (consolidation of intellectual strategies, independence, self-esteem to prepare the social insertion). Transition between phases is individual and the objectives of the program are adapted to patient needs after an extensive neuropsychological and psychopathological evaluation. We designed this program using one relative or retired teachers as provider of the services, who received training for delivering the tasks, management of the frustration and to know how obtain the results and register the data. We showed results of this program with a sample of 5 TBI patients who followed this program after their discharge of the Clinic for Cuban Patients of CIREN. All of them improved their initial neuropsychological scores and are doing social activities now. The most important variables influencing the outcomes were severity of brain damage, age, evolution, pre-morbid personality, family support and marital status.

**27P5**

**The Institutionalization and its Relation with Mental Problems and Conduct Disorder**

Luciana Mara C. Andrioti , Marcos Tomanik Mercadante
*Master Program in Development Disturbances, Mackenzie Presbyterian University, Brazil*

The inexistence of public health control in infants' psychiatry compromises the development of great part of the Brazilian population. Researches made in some institutions reveal 49,2% psychiatric disorder rates(and it represents 14,3% of the controls). The most common disorder is depression (28,6%) (Abreu 2000). In the Southeast of Brazil was identified the prevalence of 12,5% of one or more disorders, and if it is projected in the nation it suggests 3,4 million people with these problems (Bilyk, 2002). The aim of this research has been to identify the prevalence of

mental problems and conduct disorder in children and teenagers between 4 and 17 years old who live with their family and go to school, throughout the role of interviews called Development and Well-Being Assessment, DAWBA. Not only the definition of these children's profile, but also the determination of parameters in the interventions that could be re-evaluated, they will contribute to decrease the number of disorders and the impact they cause on these people, as well as their family and the community.

**27P6**

**Nursing care and neuro-rehabilitation for patients with Parkinson's syndrome**

Miyares Paz Luanda, Morgado Teresa, Rojas Morales Juana M.
*International Center for Neurological Restoration (CIREN) Havana, Cuba*

The nurse is an important link within the team involved in neurorehabilitation carrying out multiple functions and achieving improvements in abilities as well as language and rehabilitation and treatment of patients with Parkinson's syndrome because of this we felt motivated to conduct a descriptive, retrospective and transversal study involving twelve patients admitted to CIREN's Clinic Movement Disorders and Degenerative Diseases during the period from march 2002 to July, 2003. The results obtained from the majority of these patients showed great improvement in physical mobility by combining the pharmacological adjustment with the neurorehabilitation, achieving improvements in mastication and absorption of food. Almost all patients achieved adequate elimination through an education in healthy habits in diet, the taking of medication, etc. They were also able to regulate their sleep patterns and better able to utilize mechanisms of problem solving to deal with family issues.

**27P7**

**Risks in chronic neurological patients. Experience at the International Center of Neurological Restoration (CIREN)**

Lissette Miranda Lara, Maria Ángeles Peña Figueredo, Maria Isabel Garrote Lee
*International Center for Neurological Restoration, Habana, Cuba*

At the International Center of Neurological Restoration we attend patients with several neurological and neurosurgical diseases. They are exposed to many risks that can create additional complications. We made a review, in a retrospective study, using the reports to the Program for Prevention and Control of Accidents in use at CIREN. We include all reports made during year 2002. The mayor risk was falling down (21 cases) and infections (72) from the total of 1039 patients hospitalized during that year. The greatest incidence was found at the Clinic for Spinal Lesions, followed by the Clinic for Adult Static Lesions. This analysis lead to the introduction of strategies applied in our institution, by a team of nurses to decrease the risks of the patient based on the application of the Nurse Attention Process.

**27P8**

**Evaluation of quality of life in Parkinson's disease**

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The present tendency to examine the impact of treatment on the quality of life of persons with Parkinson's disease includes the development of specific instruments of measurement (PDQ-39). Recently, Martinez and his collaborators have adapted the English version of this instrument into Spanish, using 37 items, validating them appropriately, demonstrating a strong correlation between the clinical variables and the well- being of Parkinson's patients. It is highly sensitive and specific. Between January 2003 and August 2003 we developed a protocol to evaluate this Spanish version for our work. For this purpose, we have applied the Spanish version of the PDQ scale to 30 patients with Parkinson's disease, 10 who only received a pharmacological treatment, 10 who were treated with a multidiscipline approach, and 10 were operated using the technique of stereotactic surgery. We observed a high correlation with the sub sections of daily activities and motor condition on the Unified Scale for the evaluation of Parkinson's PDQ. We obtain a reduction of 40% of the PDQ scale before treatment in operated group, and strong correlation whit UPDRS scale (Spearman R 0,515). We also noted the sensitivity of the PDQ in its ability to measure the patient's ability to distinguish between ON and OFF and to note the usefulness of the above treatments. We can conclude that the Spanish version of PDQ is a useful instrument for the evaluation of the effects of any treatment on Parkinson's and is well designed to examine the utility of any clinical treatment.

**27P9**

**Appraisal of the development and growth in chilDen with cerebral palsy. Nursing care to these patients**

Norbert Sosa García, Luis Hernández Ramos, Mónica Hernández Díaz, Mirna Álvaro- Díaz Arredondo
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We performed a retrospective and descriptive study for the evaluation of 103 patients bearers of cerebral palsy, hospitalized at CIREN's Neurology Clinic for Children during January 2000 to December 2002. This issue aims at demonstrating the existence of nutritional deterioration in these children, to relate them with a psychomotor commitment and to establish specific nursing cares for their neurological rehabilitation. We selected a group of pediatric patients with ages ranging from 1 to 15 years of age. We defined the absolute frequency and percentage according to sex and applied gross motor function scale for their psychomotor assessment and clinical diagnosis, as to the type of cerebral palsy and its distribution. The evaluation of their nutritional status in relation to weight and height (according to Jordan's Scale) was performed and we determined it predominates in the psychomotor affectation in males and in those patients with a greater compromise We evidenced in these children important nutritional affectations – where 26 patients were in the percentile range from O to 25, which means a 25 % of the total of evaluated cases. Our team kept in mind, that for the sake of nursing, fundamentally educative work with the parents as to their children's nutrition and its immediate importance during the course of their neurological restoration was necessary.

**27P10**

**An experience in the treatment of Autism at CIREN'S Neurology Clinic for Children**

Idelys Sarduy, M. Eugenia García, Carlos Maragoto
*Internacional Center for Neurologic Restoracion (CIREN), Havana, Cuba*

Introduction: Autism is a relative mental impairment that typically appears during the first three years of life and it is the result of a neurobiological disorder that affects brain functioning. Main characteristics of this disease are: qualitative hindrance in the social interaction and in the development of language and communication, as well as a restricted range of activities and interests with the use of repeated and stereotyped patterns. Objective: To present our experience and results of the work with 5 cases diagnosed with Autistic Specter Disorder assisted at CIREN'S Neurology Clinic for Children. Patients and Methods: A retrospective study was performed on 5 cases, starting from the revision of defectologic records where we collected data related with treatment and responses by the patients to this treatment and to initial and final neuropsychological evaluations. Results: In all the cases favorable changes are observed as to social, intellectual and conduct relations. Conclusions: The results achieved can be considered significant by keeping in mind, time of treatment and severeness of the disorder.

**27P11**

**Nurse management to patients with temporal and extra temporal epilepsy**

Miriam Esther Guevara Pérez, Mercedes Frontela Hernández, Digna Pérez Madrigal, Lilia Morales Chacón
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Introduction: One important goal of the nurse's action in a Telemetry Unit is to identify the type of epileptic seizures of patients under long-term follow up with video-EEG.
Objectives: To describe the differential handling of patients with temporal or extra temporal epilepsy. Material and Method: Twelve patients were studied, from them 6 were previously classified as temporal and 6 as extra temporal epilepsy. The clinical, motor, automatic and autonomic signs, as well as the presence of aura, response degree and memory of events during the crisis were evaluated. Results: All patients with temporal epilepsy showed automatic movements during the ictus. The most prominent pattern at the beginning is locked gaze (90%) and aura (90%). Extra temporal crisis showed tonic-clonic generalized crisis (83.3%). None showed automatic behavior and none of them recall aura. Conclusions: In the handling of the epileptic patients with temporal seizures, it is important to keep a constant observation and verbal communication with the patient in order to detect behavioral alterations and to recognize automatic patterns (oro-facial gesture, feeding-like behavior, walking without a purpose) to allow an early detection of the crisis and to prevent trauma. Extra temporal seizures require extreme security measures, because in most cases the patients suffer loss of consciousness, along with body convulsion and rapid, uncontrolled movements. The nurse must, in every case; act to prevent self inflicted injuries, falling dawn and other potentiality noxious consequences.

**25P12**
**Intervention strategy for the training of the hemiplegic patient's family**

Tania Francia González, A. Vernis González
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In this study we propose an intervention strategy, which centers its attention in training and on the basis of orientation through the occupational therapist, to those persons in charge of caring for patients who suffer the results of stroke. It is indispensable for there to be instructed on the knowledge of the disease's characteristics, the techniques for the handling them and how to help patients in the acquisition of abilities for the development of daily life activities as important as: getting dressed, self-validism, and feeding. The method used in this investigation was the experimental one for which a sample of 30 patients was used and divided into two groups: one control group and an experimental one, each one with a total of 15 patients. Barthel`s index was used to measure self-validism level in the selected population. We arrived to the conclusion that with this type of combined therapy among specialists, family and patient the experimental group improved considerably because they were able to establish and to automate in a short period of time, the daily abilities of feeding, self-validism and dressing. It facilitated the patient's independence and it increased the level of the relatives' knowledge in the correct handling of the patients.

**27P13**
**Integral Handling of Sialorrhea on patients with Cerebral Palsy**

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Introduction. Sialorrhea may have a significant negative effect in the quality of life, of patients suffering from cerebral palsy, hindering their adequate social interactions. This disease is an impairment of saliva flux. Objective. Our purpose is to contribute to the control of sialorrhea through the application of different therapeutic procedures. Materials and methods. We presented a sample of 18 children, ranging from 2-10 years of age hospitalized at the Clinic of Neuropediatrics for a 28 days stay during years 2001-2003. We used therapy of different kinds for approximately 15 minutes, and evaluated the patients at the beginning and end of the rehabilitation cycle. The applied techniques for treatment were: intra-buccal massage, crymotherapy (in such cases where orolingual muscles were hypotonic), lemon drops and mechanical stimulation of facial points with the use of a point vibrator. Results. We obtained a great increase in the mobility of orolingual structures that intervene in saliva swallowing. Most favored categories: labial, velar and lingual praxis, where we obtained 83,3 %, 100% and 59,3 % of improvement, respectively. Conclusions. The application of different procedures to favor the control of sialorrhea on pediatric patients with cerebral palsy is considered effective in speech therapy.

**27P14**
**Disphagia in the neurological dysfunctions of communication**

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Dysphagia is a symptom present in alterations of neurological origin, and with certain frequency, overlaps with dysfunctions of communication. The objectives of the investigation were: to establish the relationship between the pathology of the communication and dysphagia and to validate an intervention strategy. The study included 170 patients assisted at CIREN that were explored integrally in the service of language therapy. The clinical records were reviewed to obtain the pertinent neurological information, with the purpose of establishing the correspondence among neurological pathology, of the language disturbances and deglutition. 59 were subjected to study and, from them, therapy was applied at 29 to check effects. They reached 74 with dysphagia, which was statistically significant as tendency (47.4) and prediction (7.3). The study was made by neurological pathology and for pathology of the language, what is of interest for the diagnosis and rehabilitation prediction. In correspondence with the characteristics of the dysphagia a Plan of Language Therapy that improves the quality of life of the patient and it facilitates a better communication was applied. As a result of the application of the program a positive evolution was evidenced. Coincidence between pathology of the language and dysphagia was statistically significant. The application of the language therapy evidenced a positive result.

**27P15**

**Logopedic suggestions for the physical rehabilitation in neuropediatrics**

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Most of the children who receive multifactorial attention in our center show speech disorders like dysarthria or oral retardation. For a better prognosis, an early stimulation of all areas of minor development is required. A close relationship of all the specialists is necessary to reach a positive result. For instance, we suggest a series of activities that the physical therapist can perform to improve communication and language development. Objective: To study the development in the patient communication and language skills acquisition during physical rehabilitation, guiding the physical therapist in the fulfillment of the logopedic objectives. Material and Methods: Suggestions were made to the physical therapist so that, during the physical rehabilitation logopedic objectives would also be accomplished. The sample was composed by 67 patients in prelinguistic stage of development. Patients took part in a three days a week, one-month rehabilitation cycle. Results: The children showed a good response the combined physical therapy. Conclusions: The physical therapist can become a language-stimulating agent during the therapy.

**27P16**

**Contribution of nursing to improve the communication of patients with dysarthria or aphasia**

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Language sequels were studied in 96 adult patients of both sexes from different countries with cerebrovascular affections: 68 Encephalic Vascular Accidents, 23 Cranioencephalic Traumas and 5 Children's Cerebral Palsy, assisted at International Center of Neurological Restoration Havana Cuba, Clinic of Encephalic Static Lesions from 2001-2002. By means of descriptive prospective studies, of which their demurrage lapsed approximately 3 cycles and an average of 21 years of age for (Encephalic Trauma and Children's Cerebral Palsy (CCP), 58 years for Encephalic Vascular Accidents (EVA), with the purpose of applying nursing actions to improve communication, thus relating rules to be followed for their effectiveness, specifying the family role and therefore, evaluating the fulfillment of objectives. This was carried out with the participation of the nursing personnel, from the different houses at night schedules from 7:00-9:00 pm, from 5 minutes up to 1 hour when logopedic tasks are completed. We consulted specialists in logopedics at our center and different bibliographies were revised that approach the topic, which makes our study coincide with these issues. The nursing staff filled out the forms for data collection with qualitative and quantitative variables. By means of an interview, the nurse formulated his/her evaluative criteria as to the entrance, at the end of each cycle and discharge from hospital. The results are expressed in charts and graphics through percentages. Aphasia turned out to be the more impacting sequel, and repetition the most frequent action, and good results were obtained.

**27P17**

**Effects of Early Stimulation Program on Spastic Cerebral Palsy outcome. A retrospective study**

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Cerebral palsy in the earliest childhood leads to retard or to stop the psychomotor development according to the biological age. The early identifications and diagnosis of spastic cerebral palsy (SCP) facility to the inclusion of patients to multifactorial rehabilitation program one them is the well-known Susana Matas's early stimulation program (ESP) in which the psychomotor condition is classified according to different fields or areas for better diagnosis and training as well as regarding to age ranks. A retrospective study was carried out in patients with diagnosis of spastic cerebral palsy (sample: 20; 0-5 years old) in order to appraise the incidence/impact of the Occupational Therapy specialty in this kind of patients as well as to evaluate the improvement of the psychomotor condition after early stimulation treatment (1-3 months). Evaluations al the beginning/end of training included: self-validity, cognition, social behavior and fine movements. Other concerns of the rehabilitation program were assumed by other specialties. Those mentally retard children submitted to the ESP showed a general amelioration of the above-cited conditions, particularly in the execution of movement tasks.

Other functions such as those associated with cognition exhibited relevant improvement too. As conclusive comment it is important to point out that several factor affects the outcome of children with SCP i.e. age, time of evolution, temporal course between diagnosis and submission to the ESP, treatment period, etc. Obviously, the functional recovery observed after ESP is very heterogeneous but always it will have a positive balance for patients.

**27P18**

**Neuropsychological evaluation in a sample of children between five to twelve years with bilingual school instruction**

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As a part of a wider study, 176 children were evaluated through a neuropsychological battery. Children were 5 to 12 year-old (both sex), they were in medium socio-economic level and they were in a bilingual school. Children were divided by sex, and by age group (5-6, 7-8, 9-10 and 11-12 year-old). Neuropsychological battery included the Boston Naming Test, Token Test, Superimposed Figures (Poppelreuter type), a Verbal Fluency Test (FAS Test) and a Sequencial Verbal Memory Test. No differences were found between sex in any of the applied tests. There was a significant difference among age groups for all the tests that were applied. Results are compared with some other reported (Ardila & Rosselli, 1994). This study will continue in evaluation of another socio-economic levels and school education.

**27P19**

**Psychosocial Factors associated to the Confrontation Process**

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A research was carried out making a cualiquantitative study of 40 patients belonging to the Intervention Crisis Unity in a Cuban General Hospital, during the last four months of 2001 and the three first months 2002. The main objectives of the present work were to evaluate the significance conceded to the vital events, the type of control employed and the kind of confrontation showed by the subjects included in the study. In addition, it was studied the relationship among these variables. In relation to the vital events significance, the category "very important" was exhibited by the majority of patients (62.5%). Simultaneously, these patients had "internal control" (55%) and they used a "central confrontation" in the problem (75%). It was found a strong correlation (r>65%) between the significance "very important" for the vital events and the central confrontation in the problem as kind of confrontation. In addition, the patients which exhibited a "complex confrontation with tendency to the problem" (7.5%) and "complex confrontation with tendency to the emotion" (2.5%); also conceded a "very important" or "important" significance to their vital events. In connection with the relationship between kind of control and kind of confrontation, a great number of patients showed "central confrontation in the problem" had "internal control" (45%) whereas only a 30% exhibited "external controls". The present work evidenced that the very important strategies to solve the problems in relation to the mental health in the population studied were: 1. to establish the new concept about his disease, 2. to found new ways in order to develop a better confrontation of their problems and 3. to locate the people in the center of the problem.

## Restoration of sensory functions

**27B1**

**Specificity and plasticity in human neurocognitive development**

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I will review ERP and fMRI results of visual and auditory and processing in normal adults and in those who have had different sensory and/or language experience. Taken together these studies suggest that within vision and audition different neural systems display considerable variability in the degree to which they are modified by early experience. Within vision, early auditory deprivation has most marked effects on the organization of systems important in processing motion information. Within the visual and auditory systems sensory deprivation has more effects on the representation of the peripheral than of the central fields. In addition, different subsystems within language display varying degrees of modifiability by experience. These results converge with

other lines of evidence that suggest it is important to distinguish these different aspects of language, and they raise hypotheses about the initial development of these different language systems. Parallel studies of normal infants, children, and adults and studies of those with abnormal development provide further evidence for the roles of genetic factors and experience in human neurobehavioral development. The results of these several different types of experiments provide evidence that some systems within the human brain retain the ability to change, adapt, and learn throughout life, while other aspects of human neural and behavioral development display multiple, specific and different critical periods.

**27B2**

**Children with cochlear implants; effects of age at implantation on speech and language development**

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Cochlear implantation is a standard intervention for restoring hearing in children with severe to profound deafness. With congenital hearing loss, early intervention is universally accepted as being beneficial, but is not always possible because of late detection, socio-economic constraints, etc. An important practical question is whether there is a critical period or cut-off age of implantation after which hearing outcomes are significantly reduced. To date we have followed more than 200 pre-lingually deaf children (mostly congenital) implanted at ages ranging from 1-17 years. Each child was tested with auditory and speech understanding tests before, and at intervals up to 5 years post-implantation. Closed-set speech perception tests included TAC and WIPI; open-set tests included PBK and GASP. We have compared the rate of improvement in performance of speech understanding tests in younger implanted children compared with those implanted at a later age. To compare these groups we have split the data arbitrarily at an age of implant of 6 years. We have also
used a binary partitioning algorithm to divide the data systematically at all ages at implant to determine the optimum split, i.e. to determine the age at implant which best separates performance of early implanted versus later implanted children. Using simple closed set tests, this age at
implantation was found to be 4.4 years. For more difficult open set tests, the age ranged from 5.6 to 8.4 years. In any case we do observe age cut-off (some might say "critical period") for cochlear implantation in the congenitally deaf child.

**27B3**

**Electroaudiometry: Advances and new clinical applications**

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Over the last decade important advances have occurred within the field of electroaudiometry (use of auditory evoked responses for objective hearing assessment). As a result new technologies have become available for early detection and characterization of hearing losses. The present paper will focus on one of such methodologies, based on the recording of the fast rate (80-110 Hz) auditory steady state evoked responses (ASSR) elicited by multiple AM tones. With this technique several frequency specific thresholds (between 0.5 and 4 KHz) can be simultaneously evaluated, with the consequent reduction in testing time. Also the responses (represented as distinct spectral peaks) can be easily identified by different statistical indexes, thus allowing automatic threshold detection. Here we summarize the main findings obtained in the clinical validation of the technique in three different groups: normal and hearing-impaired adults, 2) well babies 3) high-risk babies. In the adults results indicate that the MSSR can reliable predict the behavioral pure tone thresholds (at 0.5, 1, 2 and 4KHz). Mean differences between response and behavioral thresholds ranged between 7-to15 dB in the normal hearing adults, and between 5 to 9 dB in the hearing impaired. Also the MSSR can accurately estimate different audiometric configurations in mild, moderate and severe hearing impairments. In the well babies (between 0 and 12 month of age) different maturational changes were evidenced for the low and high frequency MSSR. Finally within the context of a targeted screening protocol the role of MSSR was investigated by means of a long term follow up study of 513 high-risk babies. Results showed that the technique provided valuable information for the diagnosis and management of infants with hearing losses, and further developed, might become useful as a frequency specific screening procedure.

**27B4**

**Objects, Attention and Brain Dysfunction**

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Substantial progress has been made in the last decade in understanding the neural mechanisms underlying visuo-spatial attention, and in how these mechanisms are affected by brain lesions. However, traditional experimental paradigms focussing on spatial selection of visual information are blind to important strategies employed by observers when processing complex real-life scenes. Here we describe new developments using a paradigm dubbed 'rapid serial object-transformation', which provides new insights into the neural mechanisms of object-based visual attention. Moreover, we argue how this method can contribute to the understanding of attentional dysfunction in several diseases and present data about deficient attentional strategies in autism and subsequent to brain plasticity induced by sensory deprivation.

**27B5**

**Impact of Visual Field Defects on Activities of Daily Living**

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There are about 550,000 patients suffering from brain lesions in Germany every year (Kasten, 2002), many of them result in visual deficits. The most frequent kind of visual impairment are visual field defects (VFD). Patients with VFD report various difficulties in activities of everyday life (ADL). We have designed a questionnaire for the self-assessment of these restrictions due to VFD. In this questionnaire the patient is asked to estimate the degree of the impact of his/her VFD on ADL. At the moment the questionnaire is used in a prae-post design for the purposes of a study testing the Visual Restitution Training (VRT) developed at our Institute. VRT is a computer-assisted training for patients suffering from VFD stimulating the transition zone between the intact and the blind area of the visual field. So far, 17 patients and 12 relatives of the patients have filled in the questionnaire before starting the VRT. Two main areas of impairment could be indentified - driving a vehicle and reading. E. g. 11 patients (64.7%) reported that they have given up driving a car due to their VFD, 10 of these patients (58.8%) said that their doctor advised them to do so; 82.4% reported that their reading was very slow sometimes, often or very often. On the base of these data a computer-assisted test containing photos of everyday life scenes in which subjects have to search for certain objects has been developed and is being evaluated at the moment.

**27B6**

**fMRI of the human sensorimotor cortex before and after subsensory whole-hand afferent electrical stimulation**

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Introduction: Stimulation of propriozeptive pathways using whole-hand electrical stimulation with a mesh-glove has been shown to improve motor performances of stroke patients with chronic neurological deficits. The aim of the study was to elaborate, whether changes in the motor cortex activation pattern can be demonstrated after electrical stimulation of the hand in volunteers. Materials and Methods: All experiments were performed on a 1.5Tesla MR-scanner in 10 healthy subjects. The motor-paradigm was self-paced finger-to-thumb-tapping of the left hand. Firstly, a baseline fMRI-examination and secondly subthreshold electrical stimulation with 0.9mA was applied for 20 minutes outside the magnet to the left hand using a mesh-glove. Thirdly, an identical fMRI run to the baseline and the second run 12 hours post stimulation was performed. Post processing was done with SPM99. Results: Group-analysis of fMRI-data showed: 1. Baseline fMRI-examinations revealed brain activation of the primary and secondary sensorimotor cortex as previously described. 2. After electrical stimulation of the left hand, there was an increase of activated pixels in these areas. 3. In addition, there was activation of regions not visible on the baseline studies. These involved the ipsilateral inferior parietal lobule, the pre- and postcentral gyrus and the superior parietal lobule. 4. These changes disappeared twelve hours post stimulation. Conclusions: fMRI reflects an increased BOLD-response due to an

increase of local-field-potentials within the sensorimotor cortex due to electrical stimulation. Thus, local-field-potentials can be successfully influenced by subsensory stimulation of afferent pathways. This holds promise for the application of fMRI in the planning of neurorehabilitation strategies.

**27B7**

**Perispinal TNF-alpha inhibition for discogenic pain**

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Objective: To examine the potential of etanercept, a biological inhibitor of tumour necrosis factor-alpha (TNF), delivered by perispinal administration, for the treatment of pain associated with intervertebral disc disease. Methods: Charts from 20 selected patients treated at our private clinic by perispinal delivery of etanercept 25 mg for severe, chronic, treatment-resistant discogenic pain were reviewed. Therapeutic benefit was assessed clinically and was documented by changes in a validated pain instrument, the Oswestry Disability Index. The patients were treated off-label with etanercept as part of our usual practice of medicine. Five detailed case reports are presented, including three additional patients. Results: Rapid, substantial and sustained clinical pain reduction was documented in this selected group of patients. The cohort of 20 patients had a mean age of 56.5 and mean duration of pain of 116 months. Nine of the patients had undergone previous spinal surgery; 17 had received an epidural steroid injection or injections (mean 3.2). This group of patients received a mean of 1.8 doses (range 1-5, median 1.0) of etanercept during the observation period. The mean length of follow-up was 230 days. Clinical improvement was confirmed by a decrease in the calculated Oswestry Disability Index from a mean of 54.85 +/- 12.5 at baseline, improving to 17.2 +/- 15.3 ($p < 0.003$) at 24 days and ending at 9.8 +/- 13 ($p < 0.003$) at 230 days. Conclusions: TNF inhibition by etanercept delivered by perispinal administration may offer clinical benefit for patients with chronic, treatment-resistant discogenic pain. Further study of this new treatment modality is warranted.

## Challenging views of AD therapy I

**27B8**

**Present and Future of cholinesterase inhibitors in the treatment of AD**

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Eighteen years after the first report of Summers, several million Alzheimer Disease (AD) patients, have been treated with cholinesterase inhibitors (ChEI).Approximately 50% of these patients have shown evidence of improvement (NICE, 2002 ) ,clinical stabilization up to one year in 20 % , up to two years in 10 % .There is no sharp distiction between responders vs non-responders and 50 % non-responders to ChEI–A will respond to ChEI-B or -C.Single dose ChEI produces f-NMR signs of activation of memory tasks in most patients (Rombouts et al. 2002 ) . CSF-ChE inhibition correlates to changes in most treated patients ( Giacobini 2002 ).This suggests that the number of non-responders is probably smaller than 50% particularly since AChE inhibition in brain at therapeutic doses reaches only 27-40% (PET). The recent discovery of the role of butyryl-cholinesterase in brain points to this enzyme a as a new target for AD treatment in advanced AD cases. Based on the functional role of the cholinergic system indication for ChEI treatment should be extended to those diseases or syndromes showing a cholinergic deficit such as Lewy Body Disease, Vascular Dementia, Parkinson Dementia, Delirium , Brain injury etc. Most interesting is the possibility of applying ChEI therapy to MCI subjects ( Minimal Cognitive Impairment ) or to potentiate beta-amyloid reducing therapies such as immunization.

**27B9**

**Executive function and cholinesterase inhibitors**

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The cholinergic system has been implicated in the pathophysiology of Alzheimer's disease (AD) and new treatments have been developed around restoration of cholinergic function. Because AD is predominantly a memory disorder, cognitive measurements of efficacy have primarily concentrated on episodic and semantic memory, with little regard to working

memory or executive function. The latter have been more frequently associated with vascular dementia (VaD). However attention, a useful indicator of executive function, declines over time in a predictable fashion and increased rates of this decline may herald more noticeable clinical deficits. The objective of the first study presented is to demonstrate executive dysfunction in AD, from memory clinic patient assessments in Swindon. This found that all tests on information processing in the test battery were as bad for AD as VaD. A review of data from studies on cholinesterase inhibitors, which included measures of executive function, will demonstrate that the cholinergic system is involved in attention and that deficits may respond to cholinergic enhancement. Differential effects between cholinesterase inhibitors will then be discussed using randomised data from a one year comparison of donepezil and galantamine. This showed similar improvements in simple reaction time, but a significant improvement of galantamine beyond any improvement achieved by donepezil in choice reaction time. As choice reaction time involves dopaminergic relays as well, this may be the first clinical demonstration of the reported nicotinic modulation by galantamine of the cholinergic system in a human population.

## Posters

**27P20**

**Self-dependence and identity of symptoms of myofacial pain syndrome (MPS) and fibromyalgia (F)**

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MPS may be occurred in 30-85 % of population (Han S.C., Harrison P., 1997), F in 2-6% (Wolfe F. et al., 1995).Number of investigators proposes MPS and F to be the one pathology. We suggest this problem to be discussing in the base of literature review, our clinical experience and the materials of our investigation work.Similarity: MPS and F are chronical conditions with pain symptoms in 100% cases. Infiltrative zones in muscles called muscular trigger points (MTPs) have place both in MPS and F. Main part of patients with MPS and F suffers from psychological disturbances. Thermal procedures in alterative muscles are used to treat both these pathologies. Difference: F is characterized by generalized muscle pain, in MPS case the pain is local. According to our clinical experience in 33 F patients and 350 patients with MPS we find out the level of psychological disturbances prevalent in F-group. Pain threshold is significantly reduced in F-group compared with MPS-group. Cerebral disturbances in electroencephalographic investigation prevalent in F-group too.Peripheral changes are expressed in MPS-group: synopsis transmission is highly affected; muscle damages are more expressed. Changes of electrical qualities in MTPs usually have place in case of MPS.

**27P21**

**Myofacial pain syndrome's prosopalgia with oral pathology on the background. Patients' rehabilitation**

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We examine 290 volunteers with loss of occlusal support. 62 of them are diagnosed to suffer from prosopalgia as a result of myofacial pain syndrome (MPS) of the masticatory system. The patients are divided into two groups (31 individuals each). Both groups get cold-agents on myofacial trigger points (MTPs), lidocaine-nicotine blockades on MTPs, antidepressants, tranquilizers, myorelaxants, laser therapy of MTPs, non-steroid analgesics, prosthetic occlusal correction. Temporomandibular joint normalization is performed in the 1st group by the post isometric relaxation (PIR) gymnastics complex for masticatory muscles. Then we teach these patients to do the gymnastics by themselves for prophylaxes. Duration of our investigation is 2-5 years. All of the patients are delivered from pain. Pain release is attained in 10,2 days in the 1st group and in 15,5 days in the 2nd group. 20 individuals from the 2nd group and 2 ones from the 1st group are found out to have season worsening of MPS lasted 7-20 days and 3-15 days consequently. 2 of 4 patients from the 1st group with season worsening don't practice the gymnastics. 11 patients from the 2nd group and 1 patient from the 1st one repeat worsening without any season dependence. Thus, in case the rehabilitation measures are included in MPS treatment the number of recovers increases as well as the duration of the disease decreases significantly. Regular gymnastics exercises let to prevent MPS worsening.

**27P22**

**The consequence of rehabilitation in myofacial pain syndrome (MPS) patients**

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As a result of our longitudinal observation of 350 MPS patients we can formulate 3 periods of the rehabilitation. The period of decreasing MPS symptoms. It includes: maximal myorelaxation (first 3-4 days); kinetic therapy; psychotherapy; manual therapy; laser therapy; using of some medicines and subsidiary methods. The period of identification and liquidation of MPS reasons: a consultation of different medical specialists and a treatment of common pathology; the examination of spinal cord (in the static and dynamic positions); an investigation of vitamins and minerals deficit. The period of MPS prophylaxis: working out of the correct moving stereotypes; a prophylaxis of common diseases; a trauma prophylaxis; the nutrition hygiene; a prophylaxis of psychological disturbances; teaching of a patients to the post isometric relaxation gymnastic complex. This consequence of rehabilitation helps practitioners to get good results in the rehabilitation of their patients.

**27P23**

**The blood concentration of tyrosine hydroxylase enzyme (TH) in myofacial pain syndrome (MPS) patients for the assessment of their adaptation**

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Statement of problem: Tyrosine hydroxylase (TH) is a special enzyme that regulates catecholamine synthesis. There are four isoenzymes of TH: TH1, TH2, TH3, TH4. TH is usually determined in liquor. At the same time leukocytes were found to contain TH. In our literature review we have no information on any clinical investigations of the blood concentration of TH in MPD patients. Purpose: The aim of our study was to investigate the blood concentration of TH in MPD patients for the assessment of their adaptation. Methods: We examined the blood of 30 volunteers 15-55 aged with different symptoms of MPD in analyzing device FP-901 “Labsistems” (Finland) with spectrofotometrical method. Results: Thus in patients with MPD we revealed the prevalence of TH3 and TH4. The increased concentration of TH3 and TH4 pointed to stress, distress and breakdown of adaptation mechanisms.

**27P24**

**Targeted etanercept for discogenic neck pain: uncontrolled, open-label results in two adults**

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Background: Etanercept, a recombinant biologic antitumor necrosis factor (TNF)-alpha therapeutic, is approved for the treatment of certain autoimmune arthritides by subcutaneous (SC) injection. TNF-alpha has been suggested to play a central role in neuropathic pain and neuronal damage associated with intervertebral disc herniation. Directed local administration of etanercept, in anatomic proximity to the site of disc and neuronal abnormality, may result in an enhanced therapeutic response. Objective: This study reviews findings from 2 patients with chronic, severe, discogenic cervical pain who were treated with a targeted cervical injection of etanercept with the objective of obtaining relief from their treatment-resistant pain. Methods: In this uncontrolled, open-label study, the case histories of 2 patients (1 woman and 1 man) presenting with a history of chronic neck pain refractory to various treatments are reviewed. Both patients were treated with etanercept 25 mg by SC injection to the cervical region (case 1) or the posterior neck overlying the spine (case 2). Results: Both patients experienced almost complete pain relief as assessed subjectively. In case 1, the Oswestry score decreased from 58 before treatment to 6 one day following treatment. In addition, 1 day after treatment the patient reported a subjective assessment of 98% pain improvement, 100% sensory improvement, and 100% weakness improvement. She has remained asymptomatic for >1 year. In case 2, the Oswestry score decreased from 44 before treatment to 4 two months after treatment. The patient reported 100% pain relief and 90% sensory improvement 1 day after treatment. At 8-month follow-up, pain improvement continued to be 100% and sensory improvements was 75%. Conclusions: Etanercept, delivered by targeted SC injection, may be of benefit for selected patients with resistant pain associated with cervical disc disease. Further study of this new treatment modality is warranted.

**27P25**

**Targeted Etanercept for Treatment-Refractory Pain Due to Bone Metastasis: Two Case Reports**

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Background: Parallel bodies of research suggest both a central role for osteoclasts in tumor-induced de-

struction of bone and the ability of biologic tumor necrosis factor–alpha (TNF-alpha) antagonists to attenuate the osteoclastmediated bone destruction that accompanies a variety of nonmalignant disorders. Additional studies have implicated TNF-alpha in the promotion of osteoclastmediated malignant osteolysis and the pathogenesis of neuropathic pain. TNFalpha antagonists have the potential to interfere in both processes. Objective: This article reviews the cases of 2 patients with treatment-refractory pain due to cancer metastases to bone who were given targeted injections of the biologic anti-TNF agent etanercept based on its potential to interfere directly with both malignant activation of osteoclasts and neuropathic pain. Methods: One patient had a diagnosis of non–small cell lung cancer and the other had a diagnosis of breast cancer. Both presented with treatment-refractory pain due to bone metastases. The 2 patients received etanercept 25 mg by targeted SC injection in anatomic proximity to the site of spinal metastasis for relief of their treatment-refractory pain. Results: Both patients experienced rapid, substantial, and sustained relief of chronic refractory pain at the treatment site after targeted administration of etanercept. Symptomatic improvement was correlated with objective measures of improvement, including weight gain in 1 patient and decreased uptake of radioactive tracer at the targeted site on positron emission tomography in the other. Conclusions: Etanercept delivered by targeted SC injection may be of clinical benefit in selected patients with treatment-refractory pain caused by bone metastases. Clinical trials are needed to define the potential benefit of biologic TNFalpha antagonists in the treatment and prevention of malignant osteolysis.

**27P26**

**Visual search for images in Alternative Communication System in girls with Rett syndrome**

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Rett Syndrome is a disorder that in its typical form affects mainly girls. It is characterised by neurobehavioural regression, loss of manual skills and severe psychomotor and language retardation. These children show significant handicap in their communication capacity and may benefit from using Alternative and Augmentative Communication (AAC). The purpose of this work was to verify the possibility of choice through visual search patterns of images of an AAC system shown on a computer monitor. Visual search patterns were analysed on two girls with Rett Syndrome, aged eight and nine, who were both in stage three of the syndrome. The computer used was a Pentium III PC with eye-tracking Eyegaze®, which consists of a camera that registers the movement of the pupil, calibrated accordingly to the user's profile. The images were shown using Trace software, which enables visual search patterns on the screen to be registered and recovered. The girls had to look at an image similar to the model, look at an image chosen by the examiner, or even, look at the image they liked the most. The results showed a systematic and correct, visual search pattern when using simple tasks in the two children. These preliminary results point to the possibility of using the direction in which they look as a way of establishing communication through computerised communication systems. Furthermore, it seems that they show a preserved capacity in understanding simple orders.

**27P27**

**Regeneration of the sciatic nerve in rats after transplantation of bone-marrow cells**

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Transection of the sciatic nerve in adult animal's results in incomplete regeneration and often results in loss of function. We investigated whether bone-marrow cells inserted into the lesion site improve and facilitate axonal regeneration after nerve transection. Adult Lister male rats were anaesthetized and had their right sciatic nerves exposed, transected and the two nerve stumps were connected inside a polyethylene tube. In one group of animals, the tube was filled with Matrigel and a suspension of 108 bone-marrow cells (mononuclear fraction) previously labeled with DAPI. The control group received only Matrigel. After 7, 21 and 42, the animals were perfused with 4% paraformaldehyde. Sciatic nerves, dorsal root ganglia (DRG) and spinal cord were removed, sectioned using a cryostat and processed for histochemistry or imunohistochemistry for S100, NF200 and NOSn. Results showed that in the proximal stump, axonal growth in the experimental animals was more than five times higher than in the control group 7 and 21 days after transplantation (7days: exp:1,2mm

n=6; control: 0,2mm n=4; p>0,01 ANOVA; 21 days: exp: 1,7mm, n=6; control: 0,3mm, n=4; p>0,001 ANOVA). 42 days after transplantation the regenerating axons were observed growing into the distal stump in the experimental group but not in the control. In addition, the number of surviving neurons in the DRGs of the experimental animals was 20% higher than in the control. Our conclusion is that transplantation of bone-marrow cells improves the regeneration of sciatic nerve axons and also improves the survival rate of DRG neurons after transection.

**27P28**

**Effects of an induced deafness in the spiral ganglion cells' density: a morphometric study**

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Although most of the sensorineural hearing losses are caused by damage to the hair cells, the resulting sensory deprivation induces important degenerative changes at different levels of the auditory pathway, including loss of spiral-ganglion cells (the first relay in the pathway). However these studies have been mainly carried out in neonatal animals but needs further replications in adults. The aim of the present study was to explore the temporal dynamic of spiral ganglion degeneration in adult rats after an induced deafness. Thirty Wister rats were used in this study. The animals were divided into five treatment groups. Animals in three of these of groups were deafened using a co-administration of Kanamycin and Frusemide. These groups were sacrificed two, four and sixteen weeks after the induction and cochleas were removed for histopathological analysis. The other two groups were used as non-treated controls (GN1, GN2), sacrificing the animals for cochlear harvesting at the beginning (GN1) and at the end (GN2) of the study. The functional integrity of the auditory pathway was confirmed with electrophysiological techniques (Auditory Brainstem responses) at the beginning of the study for all animals and one week after the hearing loss in the treated groups. For histopathology, cochleas were embedded in Spurr resin and serial semi-thin slices were obtained. Cell density (cells/mm3) was calculated from Rosenthal's canal at the cochlear upper medial turn. The results showed that ototoxicity in adult rats produced a substantial reduction in the spiral ganglion cell density that significantly increased from the second to the sixteenth week. Besides proving the efficacy of the selected deafening model, the standardization of the used techniques and the degenerative changes observed constitute the necessary basis to conduct further studies on the required conditions to preserve the auditory system function despite sensory deprivation.

**27P29**

**Effect of the duration of deafness and neural survival on the response of the auditory system in deafened guinea pigs**

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Eighteen guinea pigs were deafened by co-administration of kanamycin and frusemide. Each animal was implanted with an 8-electrode array at 1, 4 or 12 weeks following deafening. EABR input/output functions were recorded in response to biphasic current pulses. We measured the current change required to equalize EABR amplitude when pulse duration was doubled from 104 to 208μs per phase or interphase gap increased from 8 to 58μs. Following the completion of each experiment the animal was euthanased and the cochleae examined for auditory nerve survival. There was a reduction in the effect of changing pulse duration and interphase gap with increasing duration of deafness. However, this trend was not significant (one-way ANOVA), perhaps due to the large variance in the group of long-term deafened animals. There was a significant decrease in the effect of interphase gap between the 1- and 4-week deafened groups (t-test). It is possible that the large variance in the data for guinea pigs of equal duration of deafness may be due to variations in neural survival. Then, the effect of both, pulse duration and interface gap, on the EABR of deafened individuals would be correlated with of the neural survival more than the duration of deafness. These results, when applied to cochlear implantees, may provide a tool for investigating the role of neural survival in variations in performance with the implant. Support for this research was provided by the Garnett Passe and Rodney Williams Memorial Foundation, the National Health & Medical Research Council of

Australia and the National Institutes of Health (NO1-DC-0-2109

**27P30**

**Critical revision of induced modification by acupuncture in the Central Nervous System**

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Acupuncture has been used to treat different affections as: zosterian disease, sacrolumbar pain of diverse etiologies and other diseases that commit the CNS in an important way. How can acupuncture induce a therapeutic response has not yet been revealed, but there is an accumulated experience as to its action, which is still unsystematic and thus, scarcely accessible for its integration. The aim of this work was to analyze some of the action and changes provoked by acupuncture in the CNS reviewed in different articles. 35 papers published between 1985 and 2003 were revised. An analysis was performed on published data, in relation to the changes provoked by acupuncture in the CNS, so much on animal basic (12 papers) as on human clinical investigation (23 papers). The modulation of the expression of neurotrophic factors, and the variation of cellular subpopulations in the CNS areas were found in diverse paper. Also studied were the regulation by the liberation of neurotransmitter, the modification of cerebral blood flow and variation in the excitability of determined neuronal groups. Acupuncture seems induce changes in different areas and functions of CNS, a fact likely related to the therapeutic response observed in different studies.

**27P31**

**Transcraneal magnetotherapy as therapeutic alternative in the psycho-physiologic insomnia. A preliminary report**

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The present investigation was worked out between the groups of Physiotherapy from the International Center of Neurological Restoration (CIREN) and the Clinic of Sleep Disorders from the Cuban Neurosciences Center (CNC). Objective: To corroborate the possible therapeutic effect of transcranial magneto therapy on patients suffering from psycho-physiological insomnia (PI) in the improvement of sleep quality. Material and Methods: The leading study included 5 patients with psycho-physiological insomnia treated with transcranial magneto therapy in 20 sessions of a 30–minute duration with an intensity of 30 gauss, pulsating, sinusoidal wave on a CM-1750-01 Magnetic-stimulation bed. The patients were evaluated before and after treatment with surveys and psychological tests, besides being submitted to a polysomnographic study in the lab for sleep disorders at CNC-CIREN. In this test, the following variables were assessed: latency as the beginning of total sleep and REM, amount of awakenings and total sleep time. The data were processed with application of non-parametric tests (Wilcoxon, for paired series, Kruskall-Wallis and Spearman´s correlation by multiple ranges). Results: Preliminary results show that the effects of magneto therapy have an incidence on the increase of effectiveness during sleep, sleep soundness and in the number of cycles that become similar to those of healthy subjects. These results also show a diminishing in vigil states and their duration, as well as, Arousal's Index. They all show a tendency to the recovery of sleep structures, an issue that indicates that this technique of treatment can activate those centers involved with sleep generators. Conclusions: In a preliminary way, it can be appreciated that transcranial magneto therapy can constitute a therapeutic alternative in this pathology.

**27P32**

**Integration of orthopedic structural manipulation techniques with acupuncture in the handling of lumbar pain**

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Lumbar pain is a frequent health problem. In some patients, the conventional therapy does not release pain and collateral events appear because of medication. This works aims to integrate two common therapeutic procedures from holistic therapies and to describe the outcome of the lumbar chronic pain treated with orthopedic structural technique (OST) and Acupuncture (AC). 25 patients with chronic lumbar pain (more than three weeks evolution) with or without sciatica, were treated in our department, nine women and sixteen men, between 24-83 years old. According to clinical features and imagenologic test, patients were distributed in 3 groups: 1- facetary

cause- ten patient (there is not clinically or imagenologic evidence of discal pathology); 2-protusion of the intervertebral disc- seven patient; 3- extrusion of the disc –eight patients (extruded hernia). It was applied a cycle of 8 to 16 sessions according to the individual requirements: pain's outcome was evaluated by subjective pain scale: 10- the most intensive pain at the beginning, and 0- no pain. In the group 1, the release was in 2 weeks. In the group 2, in 5 weeks. Both groups finished without medication. The group 3 had a poor evolution, needing other procedures. In the chronic lumbar pain non-responsive to the habitual medication, the first two groups had a positive outcome with the integration of the therapeutic procedures. The OST acts more deeply in the etiology of pain, but is insufficient in the treatment of pain due to extrusion of the disc.

**27P33**

**Auditory evoked responses in temporal lobe epileptic patients and definite multiple sclerosis patients**

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There are controversial reports about the characteristics of auditory evoked responses in epileptic patients depends on epilepsy classification, the chronicity of the illness, the response to antiepileptic drugs, and the generators of the different components. On the other hand, studies in patients with multiple sclerosis (MS) have reported an improvement in the diagnostic sensibility of auditory evoked potentials with the use of the middle-latency evoked response, but there is no consensus. Auditory brainstem response (ABR) and middle-latency auditory evoked response (MLR) were studied in ten patients with temporal lobe epilepsy, and an equivalent number of healthy subjects. ABR and MLR of thirteen MS patients with positive MRI were compared with the normative data of our Lab, according to sex and gender. Epileptic patients showed a significant increase of I-III and I-V interpeak intervals duration with decrement of III wave amplitude, prolonged latency of all MLR components, and increased Pa-Pb interpeak interval respect to control group with reduction of Na component amplitude. Eight of the MS patients (61.5%) showed abnormalities of the MLR, but only five showed anomalies of the ABR. Considering ABR and MLR together the sensibility of the tests increased until 76.9%. Our results confirm the compromise of auditory pathway structures at different levels in temporal lobe epileptic patients. MLR improved the diagnostic sensibility of auditory tests in MS patients.

**27P34**

**Somatosensory cortical evoked potentials to laser stimulation**

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Somatosensory cortical evoked potentials were elicited stimulating A-delta and C nerve fibers of the skin by means of a laser stimulation device (Estimula-2). These fibers convey information about temperature and pain to the central nervous system. The objective exploration of these pathways can be very helpful to diagnose many neurological diseases. The present study reports the first experiences on this field in our country. Forty-five adult healthy volunteers were studied to construct a normative group, and 8 patients with thermal and pain dissociation caused by different illness were also explored. The Estimulas-2 was used to generate CO2 –laser pulses synchronized with a Neuronica 02 EP recording machine. The stimulation sites were the backs of hands and foots, as well as, the elbows and knees. Ten pulses were given in every site and after every stimulus an 800 ms EEG segment was recorded from the scalp. Single trials were averaged to obtain replicable responses. Latency, amplitude and conduction velocities were calculated for every response. The 8 patients exhibited cortical responses with longer latencies, lower amplitude and slowed conduction velocity compared to controls. The topography of the alterations varied according to the localization of the affected areas, but there was a high correlation between clinical and electrophysiological variables. It was concluded that the presented methodology is safe, reliable and of great help to neurological diagnosis.

**27P35**

**Humoral intrathecal immunity, in the diagnosis exclusion of dementia. Cytokines and antioxidant activity interaction in AD**

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Beside the utility of intrathecal immunity as a tool for the diagnosis exclusion of dementia, Inflammation and oxidative stress are refereed as biological markers from different fluids in AD looking for evidences helping to the following of disease progression. Nevertheless, no less important markers from peripheral fluids add information on the pathological events of the disease. We show an integral result of the immune-inflammatory response and oxidative stress in AD and others type of dementia. The analysis included the evaluation of intrathecal immune response using Reibergram program in different type of dementia and the quantitative estimation of pro-inflammatory cytokines (IL 1b, TNFa) following ELISA method as well as the quantitative estimation of antioxidant enzyme from serum in AD patients. The probable interaction between all these parameters was analyzed too. A Reibergram differential pattern was observed to each type of dementia. AD patients showed a significant difference to TNF a ($p<0.05$) as well as a significant interaction level to this variable with CAT antioxidant activity ($p<0.05$). The results underline the inflammatory mechanism in AD and tag the reactive oxygen species as cellular messenger instead a simple pathogenic agents to the disease, in add to the potential value of these markers to evaluate disease progression.

**27P36**

**Prevalence, risk factors and predictive models of demential syndrome and Alzheimer's disease in the Municipality of Marianao**

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The risk predictive models of dementia syndrome and AD allowed us to determine from individual risk the probability that an old person develops these diseases. Aims of the investigation: To know the prevalence of the dementia syndrome in the population over 60 years from Marianao Municipality in Havana City and the relation of some biosocial factors that are associated with its prediction. Methodology: A transversal cutting descriptive study was done in which 779 old adults were evaluated in theirs home. The dementia syndrome diagnosis was based on the DSM-IIIr criteria as well as the criteria established for the different sub-types. A predictive model of the dementia syndrome and the Alzheimer's disease (AD) was elaborated and validated in efficiency terms. Conclusions: The prevalence rates founded are as follow: dementia syndrome was 8,22%, the prevalence of Alzheimer's disease was 5,13% and vascular dementia was 1,93%. Age, female sex, family history of dementia, hypertension, antecedent of depression, and the low school level were the factors that mostly influenced on the appearance of probable AD in the population that was investigated.

**27P37**

**BM88 a cell-intrinsic determinant that regulates initiation of pan-neuronal and subtype-specific differentiation of spinal cord neurons**

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Identification of molecules that control neurogenesis is of paramount importance for designing therapies for nervous system lesions and abnormalities. We have identified BM88 as a neuron-specific protein that drives neural precursors towards commitment to specific differentiation pathways in vivo. Specifically, gain-of-function experiments by which BM88 was expressed in the neuroepithilium of the developing chick spinal cord, by means of retroviral infection and in ovo electroporation of the neural tube, demonstrated a dramatic phenotypic effect in the developing CNS. In particular, BM88 over-expression caused a substantial decrease in BrdU incorporation indicating that forced expression of BM88 drives progenitors to prematurely become post-mitotic neurons. Consistently, BM88 led to a significant reduction in the size of the electroporated side of spinal cord compared to the GFP electroporated. Interestingly enough, BM88 over-expression was sufficient to produce ectopic neurons in the ventricular zone of spinal cord, manifested by down-regulation of Notch, and up-regulation of the pan-neuronal markers ß-III-Tubulin, SCG10 and NF160. The effect was more pronounced in the ventral spinal cord where over-expression of BM88 was sufficient to initiate a programme of motor neuron differentiation characterized by ectopic expression of the transcription factor Islet1 and of the cholinergic transmitter phenotype. Moreover, a significant reduction in the pool of spinal motor neurons was evident, possibly due to a premature depletion of

motor neuron precursors and/or an effect in motor neuron migration. These results suggest that BM88 regulates qualitative and quantitative aspects of neurogenesis driving neuronal precursors to terminally differentiated neurons with a correct functional phenotype.

**27P38**

**Magnetic resonance spectroscopy as a diagnosis aid in early Alzheimer disease**

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Diagnostic procedures in Alzheimer Disease (AD) are mainly based on clinical assessment and a series of neuro-psychological tests. There is a need to develop a technique in detecting early stage of Alzheimer Disease which can be used as a standard diagnostic procedure accurately. The tools should be practice, not expensive and not invasive. One of the possibilities is Magnetic Resonance Spectroscopy (MRS). This is a preliminary study to find out in which region of the brain showing prompt biometabolite decreased that correlate with AD pathogenesis (N-Acetyl Aspartate decreased and Myo-Inositol elevated) in people with early dementia Alzheimer type. The correlation of NAA, MI and its clinical presentation (including neuropsychological test) was examined. There was sixth subjects with early AD examined by MRS and a set of psychometric (MMSE, CDR, GDS and Verbal Fluency). Result of MRS examination showed that posterior parietal lobe was the region with the most marked NAA decreased, while MII elevated not specified yet. Clinical presentation and neuropsychological tests seems in line with brain bio-metabolite decreased detected by MRS.

**27P39**

**Perineuronal Nets: A possible neuroprotective structure against oxidative stress in human brain**

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Perineuronal nets are lattice-like aggregations of extracellular matrix components, originally described by GOLGI and RAMON Y CAJAL as a reticular structure covering cell bodies and proximal dendrites of certain neurons. These matrix components mainly consist of large aggregating chondroitin sulphate proteoglycans connected to hyaluronan. PNs are associated with different types of neurons in region dependent patterns in the brain of many vertebrate species including man. In the human cerebral cortex, PNs surround several types of interneurons as well as subpopulations of pyramidal cells, which are most frequently found in motor and primary sensory cortical areas. Due to their glycosaminoglycan components, the perineuronal nets form highly negative charged structures in the immediate microenvironment of neurons and might be involved in local ion homeostasis. Perineuronal nets might also potentially be able to scavenge and bind redox-active iron, and to reduce the local oxidative potential in the neuronal microenviroment, thus providing some neuroprotection to net- associated neurons. Here, we show that neurons enwrapped by a perineuronal net in the human cerebral cortex are less frequently affected by lipofuscin accumulation than neurons devoid of a net both in normal aged brain and Alzheimer´s disease. As lipofuscin is an intralysosomal pigment mainly composed of cross-linked proteins and lipids generated through iron-catalyzed oxidative processes, this study proposes a possible neuroprotective effect of perineuronal nets against oxidative stress potentially involved in the pathomechanism of Alzheimer´s disease and related disorders.

**27P40**

**Association of Multiple Sclerosis (MS), diabetic autonomic neuropathy (DAN) and Stroke**

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The co-existence of MS and diabetes is well known. However, it is also known that the DAN appears as well as to diabetes patient very often. In 3 MS patients with DAN in a period of exacerbation appeared symptoms of stroke. We evaluated the relationship between MS-DAN and stroke in 3 patients (2 female and 1 male) having used neurophysiological (evoked potential) and neuroradiological (MRI, SPECT, CTS) examinations. Simultaneously, we recorded the results of the clinical parameters of different stroke factor as hypertension, diastolic blood pressure, cholesterol level and smoking. In the period of the follow up in the 3 patient we attempted an intense recording of all examination and therapeutic parameters.2 of the patients showed deterioration of their clinical condition and they suffered 3 episodes of strokes which they appeared in the cerebral com-

puter tomography. The man while showing a general improvement he subsequently had a stroke after which he had a slight deterioration. The results showed that the appearance of DAN in MS patients could be due to genetic predisposition. They also indicate therapeutic resistance and bad prognoses

**27P41**

**Medial Temporal and Parietal N-acetylaspartate Reduction in Elderly Adults Mild Cognitive Impairment**

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There has been growing interest in elderly adults who suffer from cognitive impairment greater than that which accompanies normal aging because these subjects have higher rates (12-15% per year) of developing Alzheimer's disease (AD) than elderly subjects who are cognitively normal (1-2% per year). It is likely that cognitively impaired elderly adults have pathologic brain changes that correspond to an early phase of AD. The current study used magnetic resonance spectroscopic imaging to examine N-acetylaspartate (NAA) concentrations in different regions of the brain. NAA is a neuronal marker; therefore a decrease in its concentration suggests neuronal loss or dysfunction. We also investigated the relationship between NAA concentration and performance on the Memory Assessment Scales word list learning test because memory impairment is a cardinal feature of AD. Twenty-four AD patients, 21 cognitive impaired but not demented (CIND) subjects, and 24 age-matched cognitively normal subjects were studied. Relative to controls, CIND and AD and subjects both had lower NAA concentrations in parietal ($p=0.01$) and medial temporal lobe gray matter ($p=0.001$). Moreover, there were no significant differences in NAA concentrations between AD and CIND subjects in these brain regions. This suggests that CIND subjects have AD-like pathology in brain regions predominately impacted by the disease. In CIND subjects, medial temporal lobe NAA concentration correlated positively ($r=0.44$, $p<0.05$) with performance on delayed list recall. This finding underscores the functional significance of reduced NAA in the brains of CIND subjects.

**27P42**

**Calcium is the unifying molecule in neurodegenerative disorders**

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Efforts to elucidate the pathomechanism of Alzheimer's disease and other neurodegenerative disorders have yielded an increasing pile of hypotheses. When analyzing thousands of scientific papers, the involvement of the central secondary messenger, calcium, becomes apparent. We demonstrate that disturbed calcium homeostasis might be a common underlying factor in brain pathologies. By targeting calcium, this new information promises to broaden our understanding of health and illness and the approaches we take to treating disease.

**27P43**

**Complications of the Pharmacological manipulations in aged people with paralytical sequels of chronical brain-vascular diseases submitted to Neurological Restauration Programs. Five years of experience**

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A retrospective study was done in aged people with paralytic sequels of chronic brain-vascular diseases that were submitted to Neurological Restoration Programs (4 weeks) in the CIREN in the last 5 years (118 patients), to know the main complications of the pharmacological manipulations in relation to the control of risk factors, sequels and self-complications of this type of affection, to determine the poly-pharmacy level in the studied sample and its possible relationships with adverse effects. It is found a real poly-pharmacy prevalence in the studied sample (25.75 of the cases had indicated 6 or more medicaments daily). The main adverse manifestations related to the medication were: gastric troubles, ortosthatic hipotension, constipation, somnolence and delirium. The main groups of medicaments involved in adverse reactions in order of frequency were: the benzodiazepines, tricyclic antidepressives, homorreologics, beta-blockers and anti-aggregants. It calls the attention the low incidence of secondary effects in the aspirin use. It is shown a high incidence in the adverse effects related to the quantity of used medicaments (57.1 % of the cases consumed 6 or more me-

dicaments). The age also represented an easy condition for the appearance of adverse reactions (47.8% of the patients of 70 years or more presented some negative effect related with the therapy). Then, it is necessary a more rational and individualized use of the doses of the medicaments in aged poly-medicated people, paying special attention to tolerance.

## Parkinson's disease

**27C1**

**Bilateral subthalamic nucleus lesion reverses levodopa-induced motor fluctuations and facilitates dyskinetic movements in an experimental model of parkinsonism**

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Glutamatergic overactivity might be involved in levodopa-induced motor complications since glutamate antagonists reverse and prevent levodopa-induced a shortening in motor response duration in 6-hydroxydopamine-lesioned (6-OHDA) rats and improve levodopa induced dyskinesias in parkinsonian monkeys and in patients with Parkinson's disease (PD). An increase in the subthalamic nucleus (STN) glutamatergic activity is believed to contribute to the pathophysiology of PD. However, the role of STN activity in levodopa-induced motor complications is not clear. In this study, the effect of STN lesions on levodopa-induced motor response complications has been investigated in rats with a nigrostriatal pathway lesion induced by 6-OHDA. Animals were injected with 6-OHDA in the medial forebrain bundle and treated with levodopa or saline for 22 days. On day 16, animals were randomly distributed in groups that were under surgery in the STN ipsilateral or contralateral to 6-OHDA lesion, or bilateral. Rotational behavior was measured on days 1, 15 and 22. Attenuation of STN activity by contralateral and bilateral, but not ipsilateral, STN lesion reversed the shortening in motor response duration induced by levodopa ($p<0.01$). Levodopa administration, but not saline, induced prominent dyskinesias in 6-OHDA-lesioned rats with additional bilateral STN lesions ($p<0.05$). The results indicate that bilateral lesions of STN potentiate the duration of levodopa-induced motor response and facilitate chronic levodopa-induced abnormal involuntary movements in 6-OHDA-lesioned rats.

**27C2**

**Epidemiological assessment of levodopa use in cuba, 1993-1998**

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Objective: To assess the use of levodopa in Cuba in the period 1993-1998. Methods: We obtained data on annual number of packages, units and strength of plain and combined, levodopa delivered from the central state own laboratory to fifteen provincial distributors to hospital and community pharmacies. An internationally established drug classification system and a reported method for epidemiological assessment of levodopa sales were applied. The reference population was Sweden in 1994. Results: National crude rates of levodopa use remained basically stable since 1994, being in 1998 0.11 DDD per 1000 inh /day, approximately fifteen times lower than the corresponding figure in the reference population. Provincial annual use of levodopa showed considerable geographical variation with lowest rates in Guantánamo, Santiago de Cuba and La Habana, highest in Ciudad de La Habana, and increasing trends in Ciudad de La Habana and Camagüey. Adjustment for age reduced approximately 50% such differences. Conclusions: Despite some methodological limitations, the results show that levodopa use in Cuba is low and consistent with reported low prevalence of PD diagnoses. If PD prevalence in Cuba is within the range described worldwide, results suggest that there is a wide space for improvement of PD diagnosis and treatment in Cuba.

**27C3**

**Clinical and genetic features of Parkinson's disease in Cuba**

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Introduction: The etiology of Parkinson's disease is unknown yet; there are many factors that increase the risk to suffer it, as genetic factors are. Objectives. To expose the clinical-genetic characteristics of this entity in our country. Methods: We were carried out a genetic clinical study of series of cases in 200 consecutive patient with Parkinson's disease, from January of the 1999 to December of the 2002, in the Hospital" Dr. Carlos J. Finlay". In the patients that it was possible we was carried out a simple segregation analysis, and in the detected families it was carried out a molecular study according to the established protocols, the samples of DNA were made a will with markers for well-known loci. Results: 31.3% of the cases had family history. The autosomal recessive inheritance was observed in 3 families one of them with a heterozygotic new parkin mutation and another with a mutation of the DJ-1 gene. Autosomal dominant. Linkage and haplotype analysis allowed us to exclude the Park1 (alpha-synuclein gene), Park2 (parkin gene, 6q25-27), Park3 (2p13), Park 5, and UCH-L1 gene (4p14-15). No mutations were found by direct sequencing of Park1. A whole genome search is almost completed. We found linkage to chromosome 19q13.3-12p. Conclusions: The inheritance is an outstanding factor in the Parkinson's disease, the genetic and allelic heterogeneity of this entity it is characteristic of the genetically complex illnesses.

**27C4**

**Neuropsychiatric disorders in Parkinson's disease. A study of 111 patients**

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Objective: To describe the presence and features of some Neuropsychiatric disorders (NPD) in a group of 111 patients with Parkinson's disease (PD). Background: NPD are commonly described among the non-motor expressions of PD and frequently they could be even more disabling than motor dysfunction itself. Methods: We studied one hundred eleven patients (56% male, non demented, ages from 30 to 80 years old) who fulfilled the clinical criteria for primary PD, in different stages of the disease (Hoehn &Yahr modified). The assessment scales used in the study were the UPDRS score for motor disability, Activities of the daily life score (Schwab-England), Cumming Neuropsychiatric Inventory, Diagnostic criteria of mood disorders (DSM IV), Beck depression inventory and Minimental State Examination (MMSE). Results: 65,7% of the patients had at least one NPD. The disorders more frequently found were: depression (45,9%); Anxiety (35,1%); Irritability (23,4%) and Hallucinations (12,6%). The presence of NPD did not correlated nor with gender neither with age, but it did significantly correlated with the duration of the disease. Conclusions: According to our data, depression is the most common NSD in PD patients and it has a higher incidence in patients with a worse motor control.

**27C5**

**Functional MRI and other images in Parkinson's disease**

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Background: Recent developments in high-resolution functional magnetic resonance imaging (fMRI) provide a powerful tool to map the cortical activation in healthy and parkinsonian subjects. In this research we study the cortical activation maps in patients with Parkinson's Disease (PD) and we compare them with a group of normal subjects. The effect of DOPA medication and the correlation with clinical motor improvement were also tested.

Methods: fMRI data were acquired in 12 patients with PD and 4 normal subjects performing a motor task, consisting in finger opposition sequential movement followed of repetitive flexion-extension movements of the hand. Statistical Parametric Mapping (SPM) package was used to detect differences in the cortical activity of patients when is compared with both normal pattern and after DOPA supply. Clinical improvement was evaluated through UPDRS motor scale and correlation with changes in fMRI signal was tested. Results: Patients with PD show abnormal activation intensities in Primary Motor cortex (M1), Pre-motor cortex (PM), Supplementary

Motor Area (SMA), inferior orbitofrontal cortex and associative parietal areas. DOPA medication induced a greater activation in motor cortical areas. Improvement in clinical outcome correlated with increase in fMRI signal in SMA, M1 and PM. Changes in SMA are particularly correlated with improvement of hypokinesia in UPDRS motor scores. CONCLUSIONS: The study indicates that fMRI enables quantitative evaluation of abnormal activation pattern in PD and the effect of therapeutic intervention. PD patterns are partially normalized in ON medication state.

**27C6**

**Ablative procedures for Parkinson's disease treatment**

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Ablative procedures for Parkinson´s disease (PD) have been used for many years. Different targets have been selected for these treatments: VIM thalamus (VIM), Medial Globus palidum (GPm) and Subthalamic nucleus (STN). We had treated more than 347 patients with different movement disorders meanly PD with more than 415 surgical procedures. Patient selection is crucial for functional neurosurgery and the correct target choice to treat according with the clinical characteristic of each patient. According to our experience (82 VIM thalamotomies, 205 Palidotomies and 126 subthalamotomies): VIM thalamotomy must be very carefully chosen for those patients with advanced age and invalidating tremor as a main sign. GPm lesion could be decided for patient with very intense LDOPA induced dyskinesia. STN lesion has the most powerful effect over parkinsonian symptoms, signs, and permit maximal reductions in drug dosage. Bilateral lesions in VIM and GPm are hazardous but bilateral STN lesions do not produce speech or neuropsychological impairments. The efficacy of the procedures are higher than 90% (with reduction in UPDRS motor score between 40 and 80%), morbidity is less than 8% and mortality less than 1%.

**27C7**

**Motor response to levodopa and oscillatory activity in the subthalamic nucleus in parksinson´s disease (PD)**

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The study of oscillatory activity in the basal ganglia and motor cortex in the physiology of motor control and pathophysiology of PD may help to understand some unexplained issues of the classical model of the basal ganglia. We studied 7 PD patients treated with electrodes for chronic stimulation. Local field potentials (LFP) from the subthalamic nucleus (STN) were recorded with the implanted macroelectrode (Medtronic). All patients were continuously recorded during the "off" to a fully "on" (following levodopa) medication state. The power spectrum of the dominant frequency of LFP activity in several frequency bands (5-10Hz, 10-20Hz, 20-30Hz, 30-40Hz, >60Hz) along the "OFF-ON" cycle were analyzed.All patients exhibited the same patron of LFP activity changing from a dominant 10-30 Hz oscillations in the "off" motor state to a higher activity (60-80 Hz) in the "on" motor state. Frequencies in the range of 5–10 Hz may have two different evolutions: A consistent peak during "off" was observed with a 4-6 Hz resting tremor (46%). Patients with coreic dyskinetic movements during the "on" showed a 5-10 Hz peak coinciding with the movements. Patients with alternating movements of the legs ("diphasic dyskinesias") exhibited a drastic drop in all frequencies. Basal ganglia oscillatory activity is dependent on dopamine deficiency. The "off" and "on" motor states in PD are not only related to hyper/hypo activity of the STN but also to changes in oscillatory patterns, that may be included in a more precise revision of the pathophysiological model of the basal ganglia.

**27C8**

**Surgery for Parkinson´s disease: Lesion or stimulation?**

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Purpose: To analyze the evolution of lesional and deep brain stimulation (DBS) surgery in Parkinson´s disease (PD), with respect to effects and side-effects, and to examine the rational for using either method in thalamus, pallidum and subthalamic nucleus (STN). Methods: Review of the author´s own experience as well as the literature on DBS and on thalamotomy,

pallidotomy and subthalamotomy was conducted. Emphasis was put on analysing trends in choice of surgical targets and procedures as well as the reported clinical results and side-effects. Results: There is only one randomised study comparing lesion with DBS: it compares thalamotomy and thalamic DBS for tremor showing less side-effects for the latter. For all other targets and procedures, only historical information is available, and shows that DBS has re-emerged and seems to be preferred to lesions. The reasons for increased popularity of DBS may be the possibility for safe bilateral and adjustable surgery, the alledged lower frequency of adverse events, the potential offered by DBS as a research tool for mapping basal ganglia, the enthusiasm of many neurologists for non-ablative procedures, the decreased experience of many neurosurgeons in performing proper stereotactic lesions, and the promoting role of companies involved in DBS. Conclusions: Although DBS is increasingly popular, it is not accessible to all PD patients in need of surgery. Lesional surgery, especially in pallidum and possibly in STN, still has a role in surgical treatment of PD, provided judicious selection of patients by neurologists, and proper neurosurgical skills in performance of stereotactic lesions.

**27C9**

**Rehabilitation in Parkinson's Disease: A Rational Approach**

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Before the introduction of L-Dopa in the late 60's, physical therapy was widely consider to be an option in the treatment of Parkinson's Disease but the development of more efficient drugs or surgical strategies in the last 40 years led to decrease interest in alternative therapies. Now is well know that the efficacy of drugs does not last indefinitely and surgery is only indicated in less than 10 % of the patients so in addition to the standard drug regimen ,physical therapy is often prescribed to help in the management of the disease.

In recent years, there have been an increase in reports of physical therapy combined with various techniques (sensory cues, treadmill training with body weight support, instructional sets and others) with promising results who are consistent with our own experiences using rehab techniques in PD.

Since 1988 to date we have been explored the efficacy and indications of the most recognized alternative methods alone or combined with standards treatment. In this review we summarized the evidence obtained from our experience and from the literature, in regarding to clinical efficacy and potential therapeutic mechanisms and propose and integral rehabilitation program to improve PD patients.

## Posters

**27P44**

**Chiropractic intervention on parkinson's rehab treatment program**

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Parkinsonism, described in 1867 by Dr. James Parkinson, is recognized worldwide among the movement disorders, the symptoms experienced are: resting tremor, bradikinesia, simioid posture, frozen shoulder, seborrhoea, sialorrhea, dementia, visual dyspraxia, orthostatic hipotension, disphagia, esophageal dismotility, constipation, etc. Patient classification has been done considering their motor, neuropsychological and cognitive capabilities. Through this observations, the motor dysfunction is considered as one of the base line symptoms to treat for the Parkinson's patient, thus chiropractic treatment plays a significant role on the restoration of proper biomechanics of the patient, through the chiropractic adjustment for the subluxation complexes presented by the patients due to the muscle tone imbalance that Parkinson's patients develop through mechanoreceptor activity and adaptation secondary to simioid posture and tremors present. The rehab program should involve an integral model in order to maintain muscle and biomechanical balance, in order to achieve improvements in balance, speed, coordination, dexterity and posture. The chiropractic adjustment in particular, functions to re-establish function at the motion unit involved (joint) and also the physiological effects that come along with the mechanical dysfunction of the sublimation complex. Adjustments are performed previous detection of the specific vertebral subluxation complexes or dysfunctional joints, through ortho-neurologic, radiological, dermathermography, bone density scans, bone scans, motion palpation, x-ray, MRI, all to trying to make the best and most accurate diagnosis. At integral health center, diverse specialist in different areas like orthopaedics, neurosurgery, neurology, chiropractic, physical medicine and rehab, radiologist, etc.

**27P45**

**Influence of attention and motor planning in the activity of primary motor cortex**

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The primary motor cortex (M1) is the main cortical output for the executive motor orders coming from cortical and subcortical pre-motor centres. The objective of this work was to study with functional magnetic resonance imaging the possible pre-motor activity of M1 in relation to its motor functions. Data show that the dimension of the M1 area activated and the intensity of response were higher during activities that need pre-motor planning (phasic movements of the forefinger, motor imagery that consisted of imagining the performance of phasic movements of the forefinger but without real movements) than during motor activities (tonic flexion of the forefinger) that practically do not need of pre-motor planning. Distracting concurrent task (numeric calculus) that did not disturb the finger movements decreased the activation of M1 induced by the phasic movements of the forefinger. There was a mosaic-like distribution for pre-motor M1 functions, with the movement of individual fingers being controlled from several M1 loci. Attention induced a fast functional reconfiguration of M1, adding M1-subsets to motor programming but excluding others. Taken together, present study show that human M1 is involved in motor activities but also in the pre-motor planning of movements.

**27P46**

**Nursing Attention Process to Parkinsonian patients candidates to selective pallidotomy**

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The Parkinsonian Syndrome is a degenerative disease of the CNS, characterized by abnormal involuntary movements. At the present moment this disease is treated surgically at different targets including the internal pallidum. The use of a personalized nursing attention process allows to achieve a superior attention care in the parkinsonian patient. The objective of this paper was to evaluate the impact of the nursing diagnosis and planned personalized attention on patients that will receive surgical treatment. For this issue, 22 patients with dyskinesia, submitted to selective pallidotomy, of which 16 were males and 6 females respectively, ranging from 35 to 65 years of age, were studied. The application of the nursing attention process allowed us to detect in those patients a 100% impairment of the hystic integrity, a 100% deficit for self-care, a 75% alteration in verbal communication, a 100% anxiety and a 100% risk of lesion. The role of nursing is fundamental in the evolution of these patients for their fast return to society.

**27P47**

**Subthalamotomy in Parkinson´s Disease(PD): Effect on L-Dopa induced dyskinesias**

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Dyskinesias are a common complication of advanced PD due to both long term L-dopa treatment and disease progression. Lesion of the subthalamic nucleus (STN) in humans is associated with hemichoreaballism. In parkinsonian monkeys STN cytotoxic or thermolytic lesions were associated with mild dyskinesia or HCB. More recently, studies using deep brain stimulation (DBS) of the STN reports low ocurrence of HCB but improvement on previously existing L-Dopa induced dyskinesias(LID). In order to better define the relationship between dyskinesias and lesion of the STN in PD we conducted an open study during the last 5 years in 17 PD patiens submitted to bilateral lesion of STN (Staged or Simultaneous) using the UPDRS and the Dyskinesias Scale. We observe a transitory increase in Peak Dose Dyskinesias , a reduction of 50 % of diphasic diskinesias and an arrest of dystonic dyskinesias coinciding with the frecuent presence of spontaneous off dyskinesias related to the surgery, at short term follow up. At one, two and three years follow up global rating of LID decreased by 50%,with more marked effect on dystonic dyskinesias and a significant improvement in both, disphasic and peak dose dyskinesias. We can conclude that subthalamotomy reduce LIDs at long therm follow up. Whether or not this only related to the reduction in the total daily dose of L-Dopa is open to discussion.

**27P48**

**Subthalamotomy in Parkinson¿s Disease: The CIREN experience**

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Surgery for Parkinson's disease is not a new concept. Ever since scientists discovered that many of the symptoms of the disease can be traced to chemical imbalances deep in the brain, there has been theoretical support for the idea of restoring a balance by removing or disabling certain overactive areas.Palidotomy is accepted as a typical example but destroying areas implicated in Parkinson's disease may has been effectively bypassed by improvements in drugs and technologies such as deep brain stimulation (DBS). In the last few years, however, the lesion of the Subthalamic nucleus (STN) has emerged as a new alternative for special circumstances. In our first study, published in the Movement Disorders Journal (2001) , we were able to demonstrate that unilateral lesion of the STN can be performed safely and improve motor function without major complications. The next goal was to assess the safety and efficacy of bilateral subthalamtomy , which was done by performing staged surgery(at least one year apart) in 7 patients. This also resulted in marked symptomatic relief without noticeable side-effects. Recently, we have assessed the effect of bilateral, simultaneous subthalamotomy in 11 patients, followed for 36 months after surgery. As a group those patients were still scoring well over 50 percent better on movement tests than they had before surgery. Significant improvement was seen on other tests and the average daily L-dopa dose had been reduced by 70%, greatly reducing some of the side-effects of the drug. Up to now we have performed subthalamotomy in 90 patients (a third bilaterally) with similar good results. In fact, experience and refinement of the technique have led to shortening the intraoperatory time and more reliable clinical results.

**27P49**

**Bilateral dorsal subthalamotomy in Parkinson's disease: initial response and long-term evolution**

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We conducted an open, pilot study of the effect of bilateral stereotactic subthalamotomy in 18 patients with advanced Parkinson's disease (PD) uncontrolled with the available pharmacological means. In 7 patients, the first subthalamotomy antedated the second by 12-24 months ("Staged surgery"). A second group of 11 patients received bilateral subthalamotomy on the same day ("Simultaneous surgery"). Patients were assessed according with the CAPIT (Core Assessment Program for Intracerebral Transplantation) and a battery of timed motor tests and neuropsychological tests. Evaluations were performed in the "off" and "on" states before surgery (base line) and at 3, 6, 12, 18, 24 and 36 months postoperatively. Compared with baseline, bilateral subthalamotomy induced a significant ($p<0.001$) reduction of 50,8 % in the "off" and 33 % in the "on" UPDRS motor scores at the last assessment. Blind rating of videotapes showing the motor status in the "off" and "on" medication states pre and at 2 years postoperatively also revealed a significant improvement. All cardinal features of PD were significantly ameliorated and Activities of Daily Living (ADL) significantly ($p<0.01$) improved. The mean daily levodopa dose was reduced by 48 % ($p<0.0001$) at 3 years after surgery. Five patients stopped taking levodopa. Dyskinesias occurred intraoperatively in 14 patients (72%) but were mild and short lasting in all but 3 of the patients from the simultaneous surgery group. These patients developed severe generalized chorea associated with fairly large lesions of the subthalamic region. The generalized chorea improved spontaneously after some 3-6 months in these 3 patients. For the whole group, levodopa-induced dyskinesias were reduced by 50 %($p<0.01$). No permanent cognitive defect or speech deterioration was detected except in three patients who exhibited dysarthria. The motor benefit has maintained after 3 years. Bilateral subthalamotomy may induce a significant and long-lasting improvement of patients with severe PD but the clinical outcome is not homogeneous. Further refinement of the procedure is mandatory before establishing it as a part of the surgical option for PD.

**27P50**

**Actions of Nursing in the neurorehabilitation of patients with Parkinson's disease**

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The team of nursery plays an important role in the neurorehabilitation of patients with Parkinson's disease (PD). The keys of our approach are the principles of neural plasticity of the Nervous System and our concept of multifactorial neurorehabilitation. The nurse's work its not the simple prolongation of physical therapy or occupational therapy which create the automation to adequate pattern of walk, stand, language and manipulative abilities; all the which are decreased in PD. The nurse's contribution is to make the learned abilities integrated in every aspect of daily life and self care. The nurse's actions search also to improve the integration of the new behavior patterns to his family and to appreciate the better quality of life.

**27P51**

**Post-surgical rehabilitation of Parkinsonian patients**

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The work was carried out at International Center of Neurological Restoration (CIREN. A sample of 60 Parkinsonian operated patients was selected, with the objective of evaluating the results of their physical rehabilitation. A random retrospective study was carried out from 1993 to 2002. It conformed a control and an experimental group of 30 patients respectively, by using 12 standard tests. Measures were taken before and after treatment in the Integral Psychomotor Evaluation Laboratory. The patients of the experimental group received a post-surgical rehabilitation for a month. The results were statistically processed to check the differences at the beginning and at the end of the rehabilitation, to compare the results with operated on patients that did not receive physical therapy. Patients who were rehabilitated after surgery, improved their initial results by increasing their mobility, balance and coordination. In both groups of patients significant differences were obtained, and the experimental group had better results in functional tests, which indicates that post-surgical physical rehabilitation contributes to a better recovery of patients.

**27P52**

**The Parkinson's Disease Gait Disorders Scale Version 3.1 (Spanish Version by Martinez et al, 2000): Introduction and Validation. Preliminar report**

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Gait disturbance is a main problem in advanced PD. Short steps, difficulties to turn, start hesitation, motor blocks and freezing induce important impairtments and falls. Some of them are refractary to drug treatment and partially responsive to surgery or trainning. To better define the overall impact of these disorders some methods and rating systems has already been developed. An integral score to assess gait in PD has been contructed and validated by Martinez et al in Spain. This instrument has strong consistence, reability and sensitivity to cuantificate the impairment to walk. From Jan 03 to June 03 we were conducting an open pilot study to introduce and validate the score in our clinic. The results show high correlation with the related items of the motor section of the UPDRS and appears as a very sensitive method to evaluate the impact of diferent therapeutical techniques on gait disturbances, better than the Tinetti score. In consecuence, we recomended the inclusion of this rating score in the follow-up of Clinical Trails in PD and to follow the response to treatment during inpatient care.

**27P53**

**The physical exercise in patients with amyotrophic lateral sclerosis**

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Introduction: The use of the physical exercise with therapeutic and health purposes is known from the antiquity but only in the last years it has begun to establish their authentic physiologic and preventive repercussion. Among the illnesses that have been benefited by the contribution of the physical exercise is the amyotrophic lateral sclerosis. This is a degenerative disease of unknown etiology that affects the

superior and inferior neurons, and is characterized by the weakness, muscle atrophy, hyperreflexia, and spasticity. Onset can occur at any moment after maturity. Objective: To analyze the effect of the physical exercise on the vital capacity, the muscular force and in the functionality of the patients with amyotrophic lateral sclerosis treated at the CIREN. Material and Methods: We used a sample of 6 patients diagnosed with amyotrophic lateral sclerosis with an age 55 year-old average and an evolution time of 2 years. All patients were evaluated in tests of: spirometry, hand dynamometry and back, application of ALS Functional Rating Scale, before beginning the treatment. The program of physical exercises was performed during 28 days. All tests were repeated after finishing the therapy. Results: A significant improvement was obtained in the vital capacity and in the functionality of the patients, while the muscular force remained almost unalterable. Conclusion: It is inferred that the properly dosed physical exercise can attenuate the effects of illness.

**27P54**

**Progresive Supranuclear Palsy (PSP):A Descriptive Study and implications for Treatment**

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PSP is an uncommon ad sporadic degenerative disease, usually observed after 50 years as a parkinsonian syndrome with refractory response to L-Dopa. Main features include axial Parkinsonism and dystonia, supranuclear oftamoplegia, pseudo bulbar palsy, dementia and imbalance with frequent falls. First described by Steel, Richardson and Olzewski at early 60` shows no or minimal response to L-Dopa, a rapid course and marked impairment due to the falls and dysphagia. The better comprehension of the semiologic and pathofisiology of cardinal manifestations allow us to design more efficient treatment approach. Based on this premises, we has been conducted a descriptive clinical and epidemiological study in 18 patients who fully complete the NINDS-SPSP Operative Diagnostic Criteria. An exhaustive clinical evaluation using the Golbe Score and a battery of complementary studies were performed and results were summarized to characterize the common picture and to analyze its pathophysiological basis in order to obtain suggestion for further approach. The average age to start was 58.6 ± 8.2 years; the mean evolution time at diagnosis was 4.39 ± 2.3 years. Gait disorders, falls and slowness were the predominant features at early stages and dysphagia and dementia were late. None of them respond to dopaminergic stimulation but some of them partially respond to cholinergic and NMDA antagonist drugs. Validism were conserved by 4 years in the 75% of the patients and ambulation and communication promotes the disability, falls and imbalance improve after rehabilitation speech not. Some pathophysiologic and therapeutic considerations can be defined in consequence.

**27P55**

**Nursing contribution to reduce the surgical time during stereotactic and functional neurosurgery for movement disorders**

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The surgical time is a main factor increasing infection risks, patient's psychological stress, and economic costs. Stereotactic and functional neurosurgery for movement disorders has several procedures that require a long time in the operating room. This paper describes the nursing contribution to reduce this time, and describes the time evolution between years 1996 to 2003. Actions carried out by the nurses are simultaneous to the surgical planning made by the neurosurgeon, or during the surgical act: That helps the physician to reduce general time of the surgical procedure. Time of surgeries made before and after the use of these nurse actions, is compared here. It is known that other factors also have influence on this variable, but a reduction of surgical time was reached with the nursing contribution. This experience has also been transmitted to other surgical teams, which have received training for stereotactic and functional neurosurgery at our center.

**27P56**

**Conscious sedation in generalised dystonia surgery**

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In the surgical treatment of patients suffering from generalized dystonia, the patient must be still and conscious in order to allow an ongoing assessment of their state throughout the surgery. We employ the method of conscious sedation in order to ensure the mentioned surgical procedure as required, using

Diprivan as the agent of sedation. We proposed, via this research, to demonstrate the use of this method in addition to defining the correct dosage of the agent employed, corroborating the level of cerebral hypnosis via the bispectral index. In the ten patients studied a favorable state was obtained for the surgical procedure by defining the range of dosage of Diprivan as between 0.8 y 1.2mcg/ml to acquire a state of tranquility and a safe level of consciousness, corresponding with a Bispectral index of 82-98. The results achieved in this study are unprecedented.

**27P57**

**Current situation of Parkinson Disease in Habana Vieja municipality 2000 - 2001**

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Objective: Evaluation of Current situation of Parkinson Disease in an urban municipality of Cuba. Methods: At this municipality, the population of 105650 inhabitants and 18% of them with more than 60 years old, which is distributed into five areas of health and 162 doctor and nurse offices; a research was developed in two phases 1) recording of all patients with Parkinson Disease diagnosis made by those doctor´s offices and 2) evaluation of all patients made by a special team of the Institute of Neurology and Neurosurgery of Cuba for a diagnosis confirmation. Results: The diagnosis for 28 patients was confirmed, predominating the group of 60 to 69 years with 25% of pathological familiar antecedents of first and second degree for the disease; 92,86% of good answer to levodopa and motor complications after 3 years of treatment cycle. The 30% of patients presented parkinsonisms by medicines. Conclusions: It was detected a low disease prevalence, with a 41.6% of over diagnosis. The hand tremor was the most frequent initial symptom and the presence of motor fluctuations was more related with long exposures to levodopa than diskynesias. The diagnosis capacity of the medical personal of primary attention must be raised.

**27P58**

**Functional magnetic resonance imaging in Parkinson´s disease before and after levodopa**

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Functional Magnetic Resonance (fMRI) was used to study blood oxygen level dependent cortical signal changes associated with volitional limb movements with and without levodopa in Parkinson's disease. Twelve patients with early stage akinetic Parkinson's disease and four volunteers underwent functional imaging while performing movements of the hand. We repeated the scanning procedure in the Parkinson's disease patients when akinesia improved after oral levodopa. Compared with the control group, patients both off and on levodopa showed movement related impaired activation in the rostral supplementary motor area, primary motor cortex and cerebellum, and increased activation in parietal cortex. We conclude that levodopa improves impaired motor initiation in the supplementary motor area and decreases hyperfunction of lateral premotor associated with Parkinson´s disease during simple volitional movements. The cortical areas cited above are not primary damaged in Parkinson's disease thus could be the target for further new rehabilitation programs.