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Session*

NEUROREHABILITATION

2021



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Neurorehabilitation

SENSORY MODULATION IN REHABILITATION

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The somatosensory system is a complex network of neurons, synapses, and receptors, through which we perceive and navigate our environment. The afferent sensory system interacts via direct and indirect projections with the brainstem, cerebellum, subcortical, and cortical structures. In late 19th century the role of sensory system in modulation of physical and mental rehabilitation was exploited. Sensory modulation helps in modulation the synaptic plasticity and long term potentiation and depression. Synaptic plasticity is a gradual process of ability of synapses to strengthen or weaken, in response to increases or decreases in their activity. The long-term potentiation (LTP) is a long-lasting enhancement in signal transmission between two neurons that results from stimulating them synchronously. Sensory modulation is applied clinically in rehabilitation of various neurological conditions like motor rehabilitation after stroke, via electrical stimulation, Tactile stimulation of the faucial pillars used for the treatment of dysphagia. Mirror therapy for phantom limb pain where the Neuromatrix theory of phantom limb pain explain tactile and proprioceptive inputs from the face and tissues near the residual limb take over specific regions of the brain. Extinction of referred sensation based on topographically organised inter-hemispheric inhibition mediated by commissural pathways helps in alleviating symptoms of phantom limb pain. Geste antagoniste or sensory trick was alleviating manoeuvres relives dystonia. Virtual reality (VR) environments used to simulate natural events and social interactions in rehabilitation of motor weakness. Thus Sensory modulation has the capacity to regulate and organize the degree, intensity and nature of responses to sensory input in a graded and adaptive manner, which allows the individual to achieve and maintain an optimal range of performance and to adapt to challenges in daily life.



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A NEW HYPOTHESIS OF MEMORY IMPAIRMENT AS A RESULT OF AGING

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As is known for the correct decision of maze tests, young rats achieve a maximum criterion after the second test, old rats needed more tests for this, but still did not achieve a maximum criterion. We suggested, that this fact should have been caused by age-related changes at the level of soluble proteins of the brain. For this purpose a quantitative distribution of water soluble protein fractions of the young and old rats brain was studied according to molecular masses. We assumed that the memory impairment should have been due to the formation of disulfide bonds among the low molecular proteins at the expense of their aggregation. Based on the above-said, a quantitative distribution of sulfhydryl and disulfide groups in the soluble proteins of young and old rats brain was specially studied. It has been established that the number of disulfide groups of water soluble proteins of old rats brain was increased by 50-60%, as compared to young ones. Based on the above-mentioned, we have got interested in the activity of NADP-H-dependent disulfide reductase activity in the various areas of old and young rats brain. Particularly, the activity of NADP-H-dependent disulfide reductase appeared to be decreased about by 35-50% in various areas of only old rats. Proceeding from this result, we search the impact of the injection of hydrocortisone in the ventricles of young and old rats brain on the elaboration of NADP-H-dependent disulfide reductase activity and conditional avoidance reflexes in young and old rats, the number of sulfhydryl groups increases by 45% only in old rats, relatively the development of conditional avoidance reflex were improved by 70%. A method for preventing memory impairment during aging by nutrition and physical activity is proposed.



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Rhythmic entrainment and the Science of brain Boosting for ADD, Autism and Anxiety

Helen Argyrou

Thought Leader Strategist | Paradigm Shifter | Speaker | Coach | Women of Truth | Clin Psych | HR Consultant | Research | Neuroscience

Neuroscience is providing such valuable Insights into ways neuroplasticity can be harnessed to aid Neuro-rehabilitation. Moreover new evidence reveals rhythmic entrainment as a new powerful method to slow down brainwaves, and integrate central nervous system functioning to reduce symptoms and optimize functioning. Treating various conditions with specific time intervals and symptom related indicators within these new techniques assisted by the technological interface help monitor and maximize results. Customization – instead of generic approaches - are a central feature that determines the success of each intervention, pointing to the importance of treating clients as an individual with specific symptoms rather than focusing on the disease, condition or diagnosis. Details will be discussed in the workshop and the experience of entrainment explained as a new form of brain boosting for anxiety, add and autism spectrum. Case studies will be referred to and.

Biography

Helen Argyrou is an innovative Clinical Psychologist, Qualified from Stellenbosh University South Africa. She is also a Peak Performance Expert Strategist and Speaker Change Leader. Delving into neuroscience resulted into her pivoting her expertise into Peak Performance to create interventions with sound and rhythm based entrainment and improve the performance of thought leaders. She has special talent in integrating science and spirituality, revitalizing education, coaching pioneers and elevating new style thinking on business. She currently practices in Cyprus and online and welcome collaborations from global female leader in her WOMEN OF TRUTH movement that elevates their credibility and authority of revolutionary integrative health practices.



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Neuro-dermatological association between psoriasis and depression: an immune-mediated inflammatory process validating skin-brain axis theory

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Objective: Our study's motive was to recognize various immune-mediated inflammatory processes involved in the pathogenesis of depression and psoriasis and interlink between them based on inflammatory mediators.

Methods: A careful and comprehensive literature search was done through various databases like PubMed, Google Scholar, and EBSCO. A total of 56 studies were included in our study after careful screening.

Results: The immune-mediated inflammatory process was significantly associated with the pathogenesis of both depression and psoriasis. Most of the inflammatory markers involved in Psoriasis (TNF- α , IL-2, IL-6, IL-23, IL-1 β , IL-10), and increased serotonin transporters (5-HTT) were also found in the pathogenesis of depression, showing the immune-inflammatory linkage between psoriasis and major depression. Based on immune chemistry, the levels of CD2+, CD4+, CD8+ T lymphocytes were also found to be raised in both depression and psoriasis, validating their relationship. Hyperactivity of HPA-axis was also found another interlink between them along with reduced melatonin amount.

Conclusions: According to various studies, the neuro-dermatological association between psoriasis and depression is significant. Different immune markers involved in the pathogenesis of depression and psoriasis also show the bidirectional association between them. However, this association between psoriasis and depression is positively correlated, but more work is required to answer why all depressed patients fail to develop psoriasis and why all psoriatic patients fail to develop depression.

Keywords: depression; neuro-dermatology; psoriasis; skin-brain axis



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A Study of Keyboard Instrument Performance Tasks and Evaluation by sEMG and MIDI Velocity for Hand Rehabilitation of Stroke Patients

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The number of stroke patients in Japan is about 300,000 per year, with 85% having paralysis and 25% having physical paralysis. If paralysis of the fingers remains, it causes a decrease in activities of daily life and an obstacle when returning to work. The rehabilitation of the fingers becomes an issue. In this study, 3 stroke patients and 7 healthy adults' control group were the subjects. The purpose was recovery of hand dexterity, and performance training of keyboard instruments was performed on the paralyzed fingers (patient group) or non-dominant hand (control group). The training effect was evaluated by surface electromyography (sEMG) during performance and MIDI data of performance. sEMG was measured on FPLM and FDSM, and normalized with maximum muscle strength (%MVC). As MIDI data, we used velocity corresponding to the strength of the performance. As a result of testing with 2-way ANOVA before and after training and due to the strength of performance, the %MVC of the patient group did not change significantly both before and after training and in strength and weakness for both FPLM and FDSM. There was no significant difference in %MVC in the control group before and after training for both FPLM and FDSM, but there was a significant difference between the levels of strength and weakness. On the other hand, velocity was not significantly different before and after training in the patient group, but there was a significant difference between strength and weakness ($p < .01$). In the control group, there was a significant difference between strength and weakness ($p < .001$), and there was a significant tendency before and after training ($p = .08$). In addition, there was an interaction between before and after training and between the strength and weakness conditions ($p < .05$). By using velocity, it can be expected to capture changes in motion that cannot be observed with sEMG. In the future, we will also observe the difference in velocity for each finger



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Clinical Case at Home: Occupational Therapy in Neurehabilitation based on video games at home

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Acquired Brain Injury is disability caused by a sudden injury to the brain. It is characterized by its sudden onset and by the varied set of sequelae depending on the area of the brain injured and the severity of the damage. These sequelae cause abnormalities in perception, physical, cognitive and functional alterations. The use of technologies for neurological rehabilitation could be beneficial for the treatment of this pathology. Alexander at age 16 suffers a fall causing brain damage acquired by a head injury. He is currently 18 years old and during these last two years he has been in different rehabilitation treatments that have improved his physical, cognitive and functional condition. Due to confinement due to Covid-19, Alex begins to receive Occupational Therapy at his home. Regarding the limitations that it presented, the impairment of motor coordination, spastic right arm without functionality, impairment in Perceptual-Cognitive aspects such as memory, attention and impairment in executive abilities stood out. Our goal is to develop an intervention plan in order to regain motor control, manual dexterity and train social and communication skills through video games on your home computer. The plan is based on the theoretical framework of learning and motor control and the Canadian model of occupational performance. We show the remarkable functional improvement experienced by Alex after eight weeks of home treatment. The rehabilitative approach complemented with video games seems to be useful to improve motor coordination, functional independence and motivation during the intervention, so it could constitute a therapeutic tool in neurological rehabilitation



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CONCEPT, CLINICAL REASONING AND SCIENTIFIC EVIDENCE OF INTENSIVE THERAPY IN NEUROREHABILITATION

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Paradigms in neurorehabilitation, and different systems of thought that have predominated in last few years in neurology, lead us to the recent era where research proposes Intensive Therapy as a new treatment concept.

This rehabilitation protocol, with a strong neurological focus by neuroplasticity, is characterised by the use of various re-education techniques and the combination of their advantages, thus explaining the great therapeutic potential of the latter. Indeed, originating from the bases of Constraint Induced Movement Therapy as well as Forced Use, this model establishes a therapeutic progression evidenced in a series of phases which objectives are clearly defined. Each of these steps contributes to improve on one or more specific aspects of motor control recovery, to achieve function and then participation, putting forward some key parameters to achieve them. Thus, the dose increase in hours or intrinsic exercise intensity, objectification of the measurements with the International Classification of Functioning or the use of clinically evidenced protocols were revealed as fundamental in obtaining significant results in the recovery of patients and their quality of life. Finally, resources such as the use of robotics and new technologies, the transfer package, active work and feedback were highlighted for their effectiveness and achievements in rehabilitation protocols.

The relevance of the “multi-technical” approach and Intensive Therapy is therefore understandable, as they are currently the neurorehabilitation procedures with most scientific evidence.



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CHILD DEVELOPMENT LEADING TO THE PURSUIT OF VIRTUES AND THE AVOIDANCE OF VICES

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Optimizing the social, emotional, moral and cognitive development of children will support prosocial behavior and peaceful societies. To accomplish these goals, efforts need to start from birth with authoritative parenting to achieve secure attuned attachment between caregiver and child. Such parenting should eliminate the toxic stress associated with the authoritarian approach and the lack of direction seen with permissive or uninvolved parenting. Early literacy is the key to building character using the vehicles of modeled behaviors, reading stories with a moral and that teach a lesson and Human Relations Programs for Children. Benevolent mindfulness characterized by emotional empathy, compassion and helping behaviors will result from proper parenting and successful character education. The resultant ability to think in a complex fashion where virtues are pursued and vices avoided should facilitate resistance to false narratives and non-violent conflict resolution. Avoiding Adverse Child Experiences has been shown to minimize depression, violence perpetration and other problem behaviors and disorders. When there are educational and professional resources in play to support the development of children in communities, a responsible, caring citizenry can be anticipated.



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Intraoperative Neurophysiological Monitoring (IONM) Alerts in 2,599 Lumbar Surgeries

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Intraoperative neuromonitoring (IONM) has been used in surgical procedures where the functional integrity of the nervous system is at risk. More recent studies have shown the benefits of IONM in lumbar surgeries. Our data shows the incidence of different alerts in various types of lumbar surgeries utilizing IONM.

We performed a retrospective analysis of IONM data of 2,599 extradural lumbar surgeries performed between January 2019 to March 2021 (males 50.2%, females 49.8%; 6-89 years, median 52 years). We identified surgical events categorized by changes in neurophysiological signals that required intraoperative intervention, surgical pause, or other efforts to prevent any neurological injury. The aims of the study were to determine the most common alert type, type of surgical approach with the highest incidence of alerts, and modality with the highest incidence of alerts.

A total of 1072 events occurred with highest incidence in lateral lumbar surgeries (21.3%) and lowest incidence in anterior lumbar surgeries (11%). A single surgery may have more than one event: anesthesia: 227, positioning: 203, surgical: 642. EMG activity occurred in approximately 75% of the cases with surgical events. 651 of the events were resolved by closing. 145 were not resolved by closing, and 74 were alerts (such as T-EMG navigation) where the modality resolution was not applicable.

According to our data, surgical events were the most common type of alerts and EMG as the common modality. IONM assists the surgical team in preventing post-operative neurological deficits. Many potential post-operative deficits were resolved intraoperatively with IONM.

2021
July 05-06
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Neurorehabilitation: The Need for a Holistic Perspective

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Industrialization improved our economic conditions but not the quality of life. There are evidences of serious negative consequences on human health leaving a damaging psychological imprint as a result of industrial revolution. Globally, one of the leading sources of disability is the neurological disorders like Alzheimer, dementia, Parkinson's disease, epilepsy, headache related disorders, multiple sclerosis, neuro-infections, neurological disorders associated with malnutrition, pain associated with neurological disorders, stroke, birth-related complications and traumatic brain injuries etc. Invasion of technology to reduce manual labor and saving time is proving to be a boomerang for our overall health. Living beings including humans are designed to work using their limbs and other parts of the body. When technology comes with lucrative offers of a comfortable life, our dependence or use of many of the body parts including the brain reduces significantly. "Use it or lose it" becomes equally important for the body as well as the technological inventions. But, we choose the later. Technology is not a problem. Our choices and decisions are. Neurological problems though are partly attributed to age-related complications; many young people these days suffer from a host of neurological problems for the overuse of and over-dependence on tech-gadgets, ultra-comfortable life and more over a choice to live a sedentary life over an active life.

Neurorehabilitation is a targeted intervention to reactivate the instant messaging services of the body in general and the nervous system in particular. The intervention through pharmacotherapy, behavior therapy or neuro-surgery aims at improving the functions at the neuronal level. However, little emphasis is given on prevention of or achieving long-term-positive impact of the interventions used. This practice makes neurorehabilitation less appealing. The current practices often fail to translate the theories and principles into actionable steps in a non-pharmacological way. As most patients come with a co-morbid condition, pharmacological interventions often interfere with other drugs making them a perfect candidate for adverse drug reactions. One of the primary reasons of all neurological disorders is lack of supply of oxygen to the brain and associated organs leading to damage in the cells, tissues, organs and systems. Though, neurorehabilitation is a complex medical process that aims to aid recovery from a nervous system injury, and to minimize and/or compensate for any functional alterations resulting from it, neurological problems do not only affect the central nervous system but also, the body as a whole.

The common practice in neurorehabilitation aims at patient's specific deficit followed by referral to a physical medicine and rehab specialist or if required a speech therapist, occupational therapist or neuropsychologist is also considered. Our body functions as a whole like a well-integrated coordinated system. Symptomatic treatment may give temporary relief, but for a long-term and positive therapeutic effect, holistic assessment of the individual, his/her surroundings including workplaces, activities, food and sleep habits are important dimensions to consider that can aid in the process of rehabilitation. For example, activities to improve mobility (movement) and maintain range of motion, muscle control, gait (walking), and balance, exercise programs to improve, prevent or decrease weakness caused by lack of use, manage spasticity and pain, social and behavioral skills retraining along with a low fat balanced diet with ample source of vitamins B6, B12 and folate, eating lots of fresh fruits, vegetables and whole grains and drinking plenty of water are the rehab protocols. As clinicians, therapists or rehab specialists, our approach is too specific to the problem and we ignore the associated factors that can be utilized for a faster rehab and making the patient lead an independent life quickly. Hence, understanding neurorehabilitation from a holistic perspective is an important area to be discussed and debated.



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Effect of Fine Motor Activities to Improve Activities of Daily Living on Upper Extremity Essential Tremor in Geriatric Population

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Back Ground of the Study: Patients with Essential Tremor have been found to exhibit upper extremity Tremor as more obvious. This upper extremity tremor significantly affects an individual ability to perform everyday task, fulfill former roles and maintain personal-social relationship. This study is to determine whether occupational therapy intervention of fine motor activity protocol based on manual dexterity and coordination activities would effectively improve the activities of daily living among essential tremor in geriatric population.

Objective: The aim of the study was to find out the “Effect of fine Motor Activities of Daily Living on Upper Extremity Essential Tremor in Geriatric Population”.

Study Design: Pre & Post-test experimental design with convenient sampling.

Method: A total of 30 patients suffering from essential tremor were selected and randomly allocated to the experimental and controls till the number of 15 subjects were reached in each group matched for age gender and chronic of illness. Assessments were done to measure the upper extremity tremor using Glass Scale, Archimedes Spiral Drawing and functional independence was measured using Tremor Activities of Daily Living Scale (TADLS). A structured occupational therapy intervention of fine motor protocol based on manual dexterity and coordination activities was tailored and implemented.

Result: After implementation patient who received occupational therapy Intervention showed significant improvement in the area of fine motor activity and functional independence.

Discussion: Occupational Therapy strategies depends primarily in systematic gradation and training of task parameters and functional adaptation which has yielded an improvement in the underlying upper extremity tremor and provided much benefit for community living. The findings say that improvement of daily living functions was related to improvement of functional independence and reduce the level of upper extremity tremor after intervention.

Conclusion: There is a significant improvement in upper extremity essential tremor in geriatric population who receive fine motor activity protocol based on manual dexterity and coordination activities of occupational therapy intervention.



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Tetralogy of Fallot with brain abscess

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Cyanotic heart disease accounts for 12.8-69.4 % of all cases of brain abscess with the incidence being higher in children and TOF (Tetralogy of Fallot) is the most common association in 13-70 % of cases. The intracardiac right-to-left shunting of unsaturated blood increases the risk of paradoxical embolism and seeding of infective pathogens in the shunted blood from the right side of the heart causes infection of brain parenchyma, resulting abscess formation. Structural changes in the heart that create turbulence and shear force in blood flow damage the endocardium, exposing the subendocardial collagen and extracellular matrix. Pathogenic organisms may settle in and infect the endocardium and limited blood supply to the damaged area leads to the formation of vegetation. These friable vegetations may embolize and escape the pulmonary phagocytic clearance of pathogens. The ischemic injury from hypoxaemia and polycythaemia, resulting low perfusion areas (microinfarcts) in the brain which may act as a nidus for infection. Headache, vomiting episodes and stiff neck may herald the onset of brain abscess. The inoculation of an organism occurs hematogenously from the infected vegetations and a single organism is isolated in majority of bacterial brain abscess. *Bacteroides fragilis* and *peptostreptococcus* are the most common anaerobic organisms isolated in cyanotic brain abscess. Echocardiography plays a key role in the diagnosis of infective endocarditis (IE) in TOF. Vegetation can occur on pulmonary and tricuspid valves and large vegetation may attach to the crest of interventricular septum.

Brain abscess is an encapsulated inflammation, fever subsides when encapsulation occurs and can be easily diagnosed by CT scan. The neuroimaging features of brain abscess vary with lesion stage and during the cerebritis stage (local suppurative encephalitis or immature abscess), ring enhancement may be absent or incomplete. The uniformly enhancing capsule is typical of mature abscess. The abscess gradually shrink, peripheral edema diminishes and then disappears in the late capsule stage. In about 50% of cases, the medial wall of an abscess is thinner than the lateral one and is thought to be due to the relatively poor vascular supply of the white matter. This explains the tendency of abscess to rupture into the ventricles and the development of secondary abscesses (daughter abscess) medially, may be seen near the primary lesion. The intraventricular rupture of brain abscess (IVOBRA) results in severe headache, an increase of meningeal irritation, a rapidly deteriorating clinical condition, and an enhancement of the ventricular wall adjacent to the abscess. The brain abscess may spontaneously bleed, presenting as an intracerebral hemorrhage. MRI is more sensitive to distinguish cerebritis from necrosis and the diffusion-weighted imaging can aid to differentiate abscess from the neoplasm. MRS (Magnetic resonance spectroscopy) appears to be useful in the diagnosis of abscesses arising from anaerobic infections because these species produce lactate and acetate, which are readily apparent on MRS and rarely found within tumor tissue.

The treatment of brain abscess has been a challenge. Sir Williams MacEwen was called as the "father" of modern brain abscess management. Heineman and colleagues became the first to report the successful medical management of a brain abscess in 1971. Medical therapy alone can be considered in patients with



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a lesion in the cerebritis stage since they are much more likely to respond to antibiotic therapy because of lack of a capsule and also for walled off, but < 2 to 3 cm in diameter abscess. The complexity of microbial flora in brain abscess necessitates empirical antibiotic therapy against both aerobic and anaerobic organisms. Usually, intravenous administration of “triple high dose” antibiotics (3rd generation cephalosporin + vancomycin and metronidazole) for 2 weeks followed by 4 weeks of oral therapy is recommended. Metronidazole is highly active against anaerobic bacteria, including *Bacteroides fragilis*, the most resistant anaerobe. Neurotoxicity such as seizures have been reported with imipenem and meropenem should be preferred for abscess due to multidrug-resistant *Enterobacter cloacae*. Antibiotic irrigation may prove helpful in case of rupture of a brain abscess (IVOBRA) into the ventricle.

If coagulation abnormalities are present, especially in cyanotic CHD, nonsteroidal anti-inflammatory drugs should be avoided, platelet concentrate should be available perioperatively and when the hematocrit > 65% requires phlebotomy and adequate hydration to maintain intravascular volume. Corticosteroids are used when a significant mass effect is visible on imaging and the patient’s mental status is depressed. Even though mannitol helps to decrease intracranial pressure, cerebral edema and ideal to reduce blood viscosity, it can cause severe dehydration, hypotension, tachycardia, acidosis and precipitate “tet spell” in cyanotic heart disease.

Surgery is the treatment of choice for most brain abscess. Needle aspiration is the most commonly used technique and total excision is preferred for solitary, superficial and well encapsulated abscesses. Neuroendoscopic technique with free hand stereotaxy has also been practiced and it has an additional advantage of more complete drainage and lavage, when compared to stereotactic aspiration. Antiepileptic medication was advised in all cases, then slowly withdrawn when the EEG become normal and the patient is seizure free for at least 2 years after surgery. Long term outcome in children with complete recovery is 30 %. The risk of recurrence is 10-50% and correction of cardiac anomaly is necessary to prevent recurrent brain abscess in cyanotic CHD.



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Effect of lead acetate on animal behavior: pharmacological study behavioral in the wistar rat.

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The main objective of this work is to study the effect of lead acetate on behavior of anxiety and depression in male and female Wistar rats. The experimental study is carried out on young rats of a number of 40, the animals are divided into 4 batches experimental, control batch and 3 batches exposed to successive doses of 0.25 mg / kg, 0.5 mg / kg and 1mg / kg of lead acetate. The metal is administered daily at 4:00 p.m. by injection under cutaneous and for a period of 8 weeks. At the end of the various treatments, the animals were subjected to the open field test (OFT), the raised cross maze test (EPM) for determine the level of anxiety and the forced swimming test to elucidate the level of depression.

The results obtained showed that anxiety and depression behaviors are clearly expressed in rats poisoned by lead acetate, suggesting that this metal induces anxiogenic and depressive effects. In addition, the acuteness of depression and anxiety is accentuated, however, as the concentration of lead increases, which reveals the effect of dependent. Our results confirm that lead causes side effects behavioral issues such as anxiety and depression.



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Efficacy of task-oriented intervention in the rehabilitation of subacute stroke patients: a systematic review

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Background: One of the most common symptoms after stroke is upper limb (UL) hemiparesis, which prevents participation in activities of daily living (ADLs) for those affected. Traditionally, neurofacilitative approaches have been used in these cases, although they do not show strong scientific evidence specifically supporting recovery from UL. One of the novel approaches to intervention is the task-oriented approach (TOA).

Objectives: To determine the efficacy of TOA rehabilitation of haemiparetic UL in adult patients with stroke (ischaemic or haemorrhagic) in sub-acute phase, assessing its effect on UL function and independence in ADLs.

Methods: A systematic review was conducted in June 2021 in different electronic databases, selecting those clinical trials carried out in patients with sub-acute stroke and in which an TOA was used for UL rehabilitation and participation in ADLs. Four randomised clinical trials were included summarising study characteristics, outcome measures, and description of the scientific evidence of their results.

Results: Across all studies, improvements in UL functions and ADL participation are found among subjects, but only those in UL are shown to be significant among subjects in the experimental groups. None of the included studies report adverse effects of the intervention or show sustained improvements over time.

Discussion and conclusions: TOA combined with other techniques, such as the use of action videos or a hybrid robotic device EMG-triggered functional electrical stimulation, have a positive effect on the rehabilitation of sub-acute stroke patients. Future research is needed to investigate further aspects such as the potential profile of the subject who may benefit of the protocols and the neurophysiological mechanisms underlying the application of this treatment technique.

Keywords: stroke, sub-acute, upper limb, activities of daily living, task-oriented intervention.



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Robotic assistance in the rehabilitation processes, for elderly people.

For most of the population the usage of new technologies in the rehabilitation process is perceived as unnecessary. On the other hand, clinicians see the potential of such solutions. In fact, robotic technology in the rehabilitation process could be used in multiple ways.

Robotic solutions can be used as a simple telephone presence tool, enabling the necessary patient-doctor contact. They could also be used for data collecting and as a transferring device. Some of the devices such as wheelchairs could be equipped with the necessary sensors that play a role between the robotic solutions and traditional rehabilitation.

With the increase of more available cheaper solutions, one can ask the question: is there a vision for the future to use socially assistive robots (SAR) in the population of elderly adults with memory loss or failures? Moreover, the current pandemic situation poses the question. If the beforehand introduced solutions could be an answer for the future?

An SAR was used in the past decade in multiple populations with various effects. The elderly population due to heterogeneity of diseases and experiences with new technologies seems to be the most demanding. I would like to discuss the current state of the new technologies used in the rehabilitation processes of elderly people today. A special focus would be drawn to the usability and acceptability of SAR usage within this population. Important aspects of designing such a device and the implementation of such solutions will also be discussed in depth.