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Needs and Standards of Rehabilitation
Rzeszów, 28th February – 1st March 2019**



Rzeszów, Poland 2019



XI INTERNATIONAL DAYS OF REHABILITATION

Needs and Standards of Rehabilitation

Rzeszów, 28th February – 1st March 2019

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Rehabilitation of a patient after a traumatic rupture of the muscle quadriceps femoris

Introduction: The muscle quadriceps femoris is a four-headed muscle of the thigh that has a basic function in the extension of the knee joint. When it is damaged, the range of movement in the knee joint as well as the inability to walk alone is reduced.

Materials and methods: We have chosen the case study of a 70-year-old patient after rupture the muscle quadriceps femoris at fall. We focused on rehabilitation after surgical treatment during immobilization in knee extension and subsequently in mobilization using kinesiotherapy. We used anthropometric measurement and the muscle test.

Results: After immobilization, we used the elements of passive and active kinesiotherapy, with an increase in the thigh circumference and increased muscle strength. We have stabilized the knee joint.

Conclusion: In the rupture the muscle quadriceps femoris, there is an important rehabilitation at the time of immobilization in the form of isometric exercise and walk training with crutches. After immobilization to passive exercise, we add active kinesiotherapy with a focus on increasing muscle strength and increasing the range of motion to flexion in the knee joint.

Key words: Exercise. Kineziotherapy. Knee joint. Muscle test.



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MVPA – health indicator?

Introduction: Physical activity is every movement performed by the human body using skeletal muscles. It is of great importance as a prophylactic and therapeutic factor. According to WHO data, in 2010, 81% of adolescents aged 11-17 were physically inadequate.

The aim of the study was to assess the MVPA in school-age children regarding the occurrence of weight disorders.

Materials and methods: The study group consisted of 1002 children (boys 527 vs. 475 girls) aged 4 to 15 years from educational institutions in Podkarpackie region.

Each participant was tested on fasting status, and further measurements were made in the morning. In each child we assessed height, body mass and we done a 7-day objective assessment of physical activity (using the Actigraph GT3X-BT accelerometer)

After collecting all the above data, the current children's percentile BMI was marked with reference to Polish percentile grids and the child body mass category was determined based

on the BMI percentile, with reference to the Barlow classification.

Results: Boys aged 12-15 spent an average of 12.7 minutes. More in moderate to vigorous physical activity (MVPA) in relation to girls ($p=0.002$). Among the youngest children (4-6 years) the difference was also statistically significant ($p=0.016$) and amounted to 9.1 minutes on average in favor of boys.

A significantly shorter time was found in the daily physical activity of MVPA in children with an increased BMI index in relation to children with a underweight or normal weight ($p = 0.049$).

In addition, children spending less than 60min. per day in MVPA are more exposed to overweight or obesity (OR = 1.36, 95% CI: 0.97-1.89).

Conclusions: Realization of recommended 60 minutes per day in MVPA by children reduces the risk of overweight and obesity.

Key words: physical activity, BMI, MVPA, overweight, obesity.



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Polish adaptation and validation of the Oxford Shoulder Score

Introduction: The Oxford Shoulder Score (OSS) is a simple and reliable, joint-specific, self-reported outcome measure tool. It can be applied for the evaluation of pain and function in patients with shoulder disease other than instability. The purpose of this study was to perform a translation and adaptation of the Polish version of the OSS and to evaluate its selected psychometric properties in patients after arthroscopic rotator cuff repair.

Materials and methods: Sixty-nine subjects participated in the study, with a mean age 55.5 (ranging from 40 to 65 years). The OSS has been translated using the guidelines recommended by Oxford University Innovation. All patients completed the OSS-PL, the short version of the Disabilities of Arm, Shoulder and Hand Questionnaire (QuickDASH), the Short Form-36 v. 2.0 (SF-36) and the 7-point Global Rating of Change Scale (GRC).

Results: High internal consistency of 0.96 was found using Cronbach's alpha coefficient. Reliability of the OSS resulted in ICC = 0.99, (SEM=1.14 and MDC=3.15). The validity analysis showed a moderate (General health $r=0.34$) to high (Physical role functioning $r=0.82$) correlation between the OSS-PL and SF-36 and a high correlation between OSS-PL and QuickDASH ($r=-0.92$).

Conclusions: The Polish version of OSS is a reliable and valid, self-reported questionnaire, which can be applied in patients with a rotator cuff tear. The very good psychometric properties of the Polish version of the OSS indicate that it can be used in clinical practice and scientific research projects.

Key words: shoulder, rotator cuff, Oxford Shoulder Score, reliability, validity



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The possibility of active and passive spinal correction in children with scoliosis

Introduction: The aim of the study is to determine grade I scoliosis, in children aged 6-18, are corrected actively and passively depending on the sex and age of the subjects.

Materials and methods: The study group consisted of 36 children (25 girls and 11 boys) with Cobb's posterior spinal curvature, improved at the Rehabilitation Clinic, which were divided according to gender and age: younger and older. Measurements of spine length were carried out in standing position and in standing positions: corrected, lying on the table for exercises on the horizontal and lowered trunk, and in the front overhang on the ladders. In addition, anthropometric measurements were included in the study: height and weight, recognition and angle of curvature of the spine according to Cobb.

Results and conclusions: In the group of younger and elderly children, some degree of active and passive correction was obtained, because the length of the spine in all tested positions was greater than the length of the habitual one, and statistically significant differences ($p < 0.001$). There was no correlation between active and passive correction of the examined children's sex. In the trial at the horizontal torso, the smallest differences were obtained, which may suggest that the strength of postural muscles is insufficient. The somatic characteristics of the examined children showed poor body structure, with the exception of the group of older girls, which was confirmed by the calculated Quetelet index.

Key words: scoliosis, anthropometric measurements, active and passive correction

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The occurrence of anamnestic risk factors of abnormal development in infants with central nervous coordination disorder from Podkarpacie – preliminary report

Aim of the study: The aim of the study is to assess the risk factors from the history of pregnancy, delivery and neonatal period in children with central nervous coordination disorder (ZOKN) from the Podkarpacie region and to determine the level of risk of development using the synthetic Z_{PZCPN} function.

Materials and methods: The test group (GB) constituted 104 infants of risk, improved in the day rehabilitation department for children. The control group (GK) consisted of 51 healthy children not requiring stimulation of development. Anamnestic risk factors from the interview and symptomatic (evaluation of the postural reactions) were determined. A comparison was made between GB and GK and in the division of the study group due to the degree of central nervous coordination disorders in four subgroups (ZOKN1-4) and pregnancy duration (CTC) in three subgroups: children born on CTC_0, premature babies 34-37Hbd -CTC_1 and premature babies born below 34Hbd-CTC_2 in the range of risk factors

and socio-living conditions. The level of risk was calculated using the synthetic diagnostic function Z_{PZCPN} , created thanks to the Krefft method with 14 diagnostic features.

Results and conclusions: The results of the statistical analyzes performed showed a significantly higher level of risk measured by the Z_{PZCPN} function in the study group (GB) ($Z_{PZCPN} = 0.5804$) in comparison with the GK ($Z_{PZCPN} = 0.3022$); ($p < 0.001$). In subgroups due to CTC and ZOKN, the highest mean values of Z_{PZCPN} were recorded in premature babies ($Z_{PZCPN} = 0.8523$ and $Z_{PZCPN} = 0.6759$) and in infants from ZOKN4 and ZOKN3 ($Z_{PZCPN} = 0.7277$ and $Z_{PZCPN} = 0.618$ respectively). Moreover, it was shown that on average for one child in GB there are 8 risk factors (7.9 ± 3.8), in the control group GK (1.4 ± 1.5), $p \leq 0.001$. The occurrence of a greater number of harmful factors was also noted in subgroups ZOKN3-4 and in subgroups of premature babies (11 ± 4.3), (12.1 ± 2.9).

Key words: infants, anamnestic risk factors, ZOKN



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Assessment of psychomotor development dynamics of improved children from Podkarpacie in the first, second and third year of life MFDR tests – preliminary report

Aim of the study: The aim of the study was to assess the dynamics of psychomotor development of improved children from Podkarpacie with tests of the Munich Functional Developmental Diagnosis (MFDR) and to determine the level of development using the synthetic diagnostic function Z_{PRPM} .

Materials and methods: The study group consisted of 104 infants of risk, improved in the day rehabilitation department for children. The evaluation of psychomotor development and its dynamics was carried out in the study group (GB), divided by the degree of central nervous coordination disorders (ZOKN) and duration of pregnancy (CTC): in the I- before therapy, II- in 12 months, in III-examination in 18 mż and IV-examination in 26mż MFDR tests. Quantitative and qualitative analysis of spontaneous motor skills was carried out. All deviations from the designated time intervals and accepted norms were treated as developmental disorders. The standardized developmental age (ZWRD%) was calculated, describing the level of psychomotor skills tested (in% of norm) and the level of development was determined by the synthetic diagnostic function of Z_{PRPM} .

Results and conclusions: Observation of psychomotor development in children with pre-therapy risk showed a significantly lower level in all skills, although greater delays were noted in the motoric rather than cognitive spheres ($p \leq 0.001$). After six months of therapy, children reached levels above 93-95% of the norm, except for the age of walking. Slight delays in development (up to 10%) have been demonstrated in the studies in III and IV in children with severe disorders in ZOKN4 and in premature babies born below 34Hbd CTC_2 in the age of walking (WCh), speaking (WM) and independence (WZS); ($p < 0.001$). It was found that the level of development significantly depends on the degree of ZOKN and duration of pregnancy (CTC), because the higher the degree of ZOKN and the shorter duration of pregnancy (CTC) determining the degree of prematurity, the lower the level of psychomotor development measured by the function of Z_{PRPM} .

Key words: risk children, psychomotor development, MFDR tests



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Physical therapy approaches for the elderly in Ukraine

Introduction: In Ukraine physical therapy for elderly combines a combination of approaches including stretching, walking, massage, hydrotherapy among others. The goal of physical therapy for elderly people is to make daily tasks and activities easier. And to make them independent as it possible.

Materials and methods: Physical Therapists (PT) diagnose and treat, try to develop plan using a variety of treatment techniques to increase a person's movement, reduce pain, restore function. The first goal of PT is to reduce pain, it will apply various techniques to increase flexibility, strength, coordination and balance. Types of PT which we use:

Manual Therapy is performed by the hands of the therapist with the goal of relaxing the patient, reducing pain, and providing more flexibility. Massaging muscles and the body's soft tissues to relax the patient, improve circulation and relieve pain. Heat Therapy relaxes muscles and improves blood circulation, which is useful for loosening stiff joints from osteoarthritis or other conditions where you've been immobilized. Hydrotherapy uses water to treat diseases and to

maintain health, healing soft tissues, increasing blood flow, and relaxing the entire body. Physical Therapists educate patients in every session. Patients are taught how to perform daily tasks, protect their body from re-injury, perform exercises at home, and how to make their homes a safer place.

For stroke patients, PT use movement therapy, where he is forced (patient good limb is restrained) to use patient weaker arm or hand. Motor imagery and mental practice involves rehearsing movements without actually doing it. This stimulates that part of brain that controls movement.

Parkinson's disease patients perform exercises that improve trunk flexibility to avoid the robotic movements the disease produces. PTs work Alzheimer's patients using exercise, which can improve memory and delay the onset of more serious memory problems.

Conclusion: physical therapy can help elderly in every area of health care. PT can give back independence by increasing mobility and making daily tasks easier.

Key words: elderly, physical therapy, approach



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Pain in the facial and cranial complex – treatment methods

Introduction: The pain within the facial and cranial complex is usually acute and strongly felt by the person and causes disorders in the activities performed by that person. Temporomandibular disorder is one of the most frequent pain in the facial part of the skull. Diseases associated with the temporomandibular region include a number of clinical problems that are manifested by disorders in the muscles and joints of the temporomandibular region.

Materials and methods: A review of the literature was carried out in terms of the effectiveness of pain therapy in patients with facial and cranial complex dysfunction.

This work is for reference only. The PubMed and Google Scholar database has been reviewed. Keywords used in the search are: temporomandibular joint, manual therapy, manipulation, massage, mobilization, exercise, dry needling, oste-

opathy, physiotherapy, physical therapy. The authors focused on reports published in Polish and English.

Results: Manual therapy and mobilization techniques are the most common therapeutic approach used in rehabilitation within the facial-cranial complex. It has been found that manual therapy is a viable and useful method in the treatment of temporomandibular complex dysfunctions.

Conclusions: Scientific literature indicates that physiotherapeutic methods lead to a reduction in pain and an increase in the range of motion in the temporomandibular joints. However, the results are not conclusive and further research is necessary before these results can be considered as fully generalized. It should be noted that all methods of therapy show positive effects of treatment.

Key words: temporomandibular joint, pain, methods of treatment

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The role of physiotherapy after resection of the lung parenchyma

Introduction: The purpose of the work was an evaluation of the progress of the respiratory function of sick persons with spirometric borderlines values who were prepared for the surgical treatment of the pulmonary parenchyma and assessment of the impact of rehabilitation physiotherapy patients after surgical pulmonary resection on exercise tolerance.

Materials and methodology: The study included 50 randomly chosen patients hospitalized in the Department of Thoracic Surgery, Podkarpackie Centre of Pulmonary Diseases in Rzeszow who have stated limited values of spirometry. All patients were assessed twice according to selected function parameters of respiratory system, ie. in the preoperative period and 6–7 days after surgery. Patients were subjected to physiotherapy rehabilitation program before and after surgery.

Results: On admission, before the implementation of the program of physiotherapy respiratory function of the exam-

ined patients was 65.74% of accepted norm. Initiating implementation of the plan of rehabilitation at an early stage in postoperative improved the respiratory function from I to V-VII days after surgery to the value of 172.94%. Mobility of shoulder joints movement raising of the upper limb by abduction before surgery averaged 77.2%. In the first day after surgery, patients achieved a result of 53.54%. At the end of the rehabilitation the average scope of movement was 85.37%.

Conclusions:

1. Implementation of rehabilitation before treatments in patients with hyperplastic changes in the lungs enabled them to qualify for surgery.
2. Application of the rehabilitation program in the early postoperative period had a significant impact on reducing the intensity of dyspnoea and increasing exercise capacity.

Key words: lung cancer, rehabilitation, surgery



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Koło naukowe energii fizycznych stosowanych w fizjoterapii

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The effects of complex spa therapy among patients with degenerative spine disease

Introduction: Degenerative spine disease is one of the most common causes of locomotor system dysfunction. In addition to pain, the disease causes decrease of health level in everyday life and deterioration of quality of life. The treatment consists of complex physiotherapy including kinesiotherapy, physical therapy and various forms of massage. The complex sanatorium treatment is also effective.

Aim: The assessment of short-term effects of sanatorium treatment among patients with degenerative spine disease.

Materials and methods: 288 people with degenerative spine disease participated in the study. 98 of them received complex sanatorium treatment in a sanatorium in the Subcarpathian Voivodeship. 90 people received complex physiotherapy in an outpatient physiotherapy office. 100 patients did not receive any treatment, apart from the independent occasional use of painkillers. VAS pain rating scale, modified Laitinen questionnaire of indicators of pain, Life Satisfaction Questionnaire LISAT-9 and Health Assessment Questionnaire (HAQ) were

used to assess the condition of the patients. The first study was conducted before the treatment implementation and the second one was conducted one month after the end of treatment. The study was also simultaneously conducted in the group, which did not receive a complex treatment.

Results: There has been a significant improvement of the overall result of the Laitinen questionnaire ($p < 0,001$), VAS scale ($p < 0,001$) and HAQ in the sanatorium treatment group and in the outpatient treatment group. In the control group there has only been an improvement of the result of the VAS scale ($p < 0,01$).

Conclusions:

1. Both complex sanatorium treatment and complex outpatient physiotherapy conducted among patients with degenerative spine disease bring satisfactory short-term results.
2. Complex sanatorium treatment for patients with degenerative spine disease in short-term is the most effective in pain relief and improvement of functional status.



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Physiotherapy after total knee arthroplasty in a patient with haemophilic arthropathy in haemophilia A – a case study

Introduction: The knee joint is one of the most frequently affected by haemophilic arthropathy, and alopasty of an ankylosed knee is used in the case of advanced degenerative changes. The aim of the study was to present physiotherapy after total knee arthroplasty in a patient with haemophilia A. **Materials and methods:** A 49-year-old man after a left knee arthroplasty with haemophilic arthropathy was subjected to a 6-week rehabilitation. The evaluation using: WOMAC questionnaire, timed up and go test, goniometric measurement of

range of motion, Lovett scale, Visual Analogue Scale (VAS).

Results: An improvement in the range of motion of left knee and muscle strength were achieved. Reduction of pain from 9 to 3 on the VAS scale. In the TUG test, the improvement was 35%, and in the WOMAC scale 47%.

Conclusions: Physiotherapy is an effective and safe procedure.

Key words: Total knee arthroplasty, haemophilia A, physiotherapy.



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Differences in the level of sensory integration in four- and five-year-olds children from Wrocław kindergartens

Introduction: People learns and develops throughout his life with the help of information received by the senses. Sensory integration is the process of organizing sensory stimuli (information) in the central nervous system, the purpose of which is to create the correct response to a given stimulus. Disruptions in this process cause difficulties in adapting to the environment in which the child lives and functions. The aim of the study is to describe the level of sensory integration in four-year-olds and five-year-olds children from the two kindergartens in Wrocław.

Materials and methods: The study was carried out using two research tools. The first of them is the Southern California Sensory Integration Test by Ayres, it was used to examination 49 children, 23 four-year-olds and 26 five-year-olds, including 21 girls and 28 boys. The second tool was the Sensorimotor Questionnaire according to Z. Przyrowski, which was completed by 49 parents.

Results: The results were statistically analysed using the Statistica 13 program (StatSoft, USA). The level of significance was assumed at $p = 0.05$. Five-year-olds children, statistically significantly more often than four-year-olds, obtained a test for hyperactivity and dispersal and have a significantly higher

deficit in the finger identification test. As children grow older, they spend more time in front of the computer and television, which limits the development of superficial feelings. The largest connections between assessed senses in children aged 4 and 5 occur in 3 pairs: 1. between Right and Left Differentiation and Poroticular Nausea 2. between hyperactivity and dispersal and tactile defences, 3. between Equilibrium in Standing Position with Open Eyes and Equilibrium in Standing Position with Closed Eyes. This confirms that sensory systems are interrelated. The greatest risk in the area of sensory integration disorders observed by parents examined by the Sensorimotor Questionnaire in four-year-olds and five-year-olds concerns the sensitivity of the balance and movement system.

Conclusion: On the basis of the conducted research, the following conclusion was formulated: there is a need to introduce a preschooler's parents education and educators in kindergartens regarding the impact of a sedentary lifestyle on the development of sensory integration processes in a child and show them a way to provide children with more attractive forms of leisure time than a computer or TV.

Key words: sensory integration, pre-school children

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Incidental surface deformations of Weller endoprosthesis hip joint heads

Introduction: On a few surfaces of Weller endoprosthesis metal heads, removed because of an aseptic loosening, were observed some random defects like scratches, which were occurred in consequence of so called “wear of third bodies”. The occurrence takes place when some hard element (in that case the crumbled away molecules of cement) will penetrate between two cooperating surfaces. The cement which is harder than metal, damages cooperating surfaces of work knot “polyethylene acetabulum – head”.

The main objective of the paper is the SGS changes presentation of Weller endoprosthesis heads, damaged by accidental penetration of cement molecules between co-operating surfaces of cup and head.

Materials and methods: Material consists of two samples of surface heads of Weller endoprosthesis on which were observed some random damages in the shape of scratches. On the first there were observed deep and continuous scratch and on the second shallow and broken scratch.

Measurements of SGS were performed by using The Rank Taylor Hobson Talyskan 150 apparatus. The data obtained were recorded and scientifically described using the program Talymap 3.0. SGS presented in 3D system and intersections in 2D. The depth of changes was described by the amplitude parameter St – this is the distance between the highest top

and the deepest area of the scanned surface measured in micrometers (μm) and nanometers (nm).

Results: The reason of rise of directed scratches on the Weller endoprosthesis surface was “the wear of third bodies”. The character and the depth of the scratch were depended on the size and irregularities of grain and on fixity anchorage of cement chip inside cup.

The deep and continuous scratch had the abrupt edges, depth of about $6\ \mu\text{m}$ and it was about 50 times deeper than the basic roughness of head surface. Out of scratch the picture shown perfectly smooth surface of head ($St=129\ \text{nm}$).

The shallow and discontinuous scratch was few times deeper than the biggest heights of head surface irregularities. But it was much more shallow than deep and continuous scratch. Out of the scratch limits the value parameter of head St equals $159\ \text{nm}$.

Conclusions:

1. Bone cement molecules, which forced to surface of polyethylene cup and head, produced some scratches on the metal heads of Weller endoprosthesis.
2. Observed scratches on the heads surface were considerably deeper in comparison with the basic roughness of surface.
3. The direction of scratches is coincident with the vector of displacements on the surfaces of polyethylene cup and head contact.



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The level of physical activity and the quality of life of office workers

Introduction: The aim of the work was to assess the level of physical activity of office workers and its impact on their quality of life. The socio-economic characteristics determining the undertaking of sporting activity were also analyzed.

Materials and methods: The International Physical Activity Questionnaire (IPAQ) in the long version was used to assess the level of physical activity. To assess the quality of life of office workers was used a questionnaire SF-36v2 (The Medical Outcomes Study 36-Items Short - Form Health Survey). The procedure of purposeful selection of respondents was used. At the same time, the respondents had to meet four criteria: work in an sitting position, have a sedentary nature of work, be in the age range of 18 to 65 and live in the Podkarpackie Voivodeship. The number of subjects subjected to the final analysis was 200 (116 K and 84% M) with an average age of 39.4.

Results: The analysis of the collected material showed that

10.5% of respondents declared a high level of physical activity, 56% moderate, and 33.5% low level of physical activity. It was shown that gender, age, place of residence, education, material situation had no impact on physical activity undertaken by office workers. However, there was a statistically significant relationship between the marital status and the level of physical activity. Respondents with a high level of physical activity were characterized by a higher quality of life in the physical and mental sphere than workers with moderate or low activity. The main reason for taking physical activity among active office workers was the appearance.

Conclusions: The obtained results can be the basis for further studies involving a larger number of respondents.

Key words: physical activity, quality of life, working in sitting position.



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Participation of children and adolescents with type 1 diabetes in extracurricular physical activities

Introduction: The willingness to be active and achieving appropriate motor skills during childhood is very important for maintaining high physical activity in later life. Diagnosis of the chronic disease creates a higher risk of neglecting physical activity. The aim of the study was to assess the participation of children and adolescents with type 1 diabetes in extracurricular physical activities and to review the most commonly types of physical activities attended by subjects.

Materials and methods: Answers from the own questionnaire from 215 parents of children and adolescents with type 1 diabetes were analyzed. The age of the respondents ranged from 6-18 years (mean 12.61 years \pm 3.26 years), the mean body weight was 49.65 kg \pm 17.46 kg, 54% lived in the rural environment, 46% in the urban area. The questions concerned medical history, participation in extracurricular physical activities and subjective assessment of the child's physical activity by the parent. The data was analyzed statistically,

and the results were shown in figures in percent values (%).

Results: Most respondents, ie 124 children (57.7%) participated only in obligatory PE lessons at school, 80 children (37.2%) declared additional participation in extracurricular physical activities, and 11 children (5.1%) did not participate in both of them. The most popular type of activities were swimming pool (10.2%), football (9.1%) and volleyball (6.1%). Most parents, ie 133 (61.9%) assessed the child's activity level as an average.

Conclusions: Chronic disease is a significant factor which can change everyday functioning and reduce the child's willingness to be active. Most children with type 1 diabetes, don't participate in any additional type of exercise, except in-school activities, and some of them don't participate even in PE lessons, which is a significant problem worth of analyzing more closely.

Key words: physical activity, type 1 diabetes, children, adolescents



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„Rola postępowania fizjoterapeutycznego po resekcji miększu płuca. (The role of physiotherapy after resection of the lung parenchyma.)” (Rzeszów, Wrocław)
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Factors Associated with Disability and Quality of Life among the oldest-old in Poland

Introduction: In the world, the number of the “oldest-old” persons grows faster than the total number of older people. The prevalence of health problems increases with age, which leads to the rise in the costs of medical, social and long-term care.

Materials and methods: The study was conducted in a group of 498 people aged 80 and more who live in south-eastern Poland. The WHODAS 2.0 questionnaire was used to assess disability and functioning. The quality of life was assessed by means of the WHOQOL-Bref questionnaire.

Results: The general average level of disability was 37.41, with women having a higher level of general disability than men (38.94 vs. 33.94). The highest general disability level was found in people with depression. There were no statistically significant differences in the level of disability between the sexes. Significantly higher level of disability occurs in women who are older, with education at most vocational, not belonging

to a social organization, not able to get help from other people and developed greater number of chronic diseases. In the group of men, the level of disability increased with age and the occurrence of each subsequent chronic illness. It has been shown that higher education, doing exercises, social activity and the opportunity to get help from other people have a particularly strong impact on a higher level of women’s quality of life, whereas considering men, there was a relationship between physical and social activity, adaptation of the external environment and a better quality of life.

Conclusion: Identification of factors influencing the reduction of disability and improving the quality of life, taking into account the differences between the sexes, should be a priority in the development of health strategies in the group of people among the oldest-old in different regions of the world.

Key words: aged, disability, quality of life



Damkjær Moen Rikke

Made for Movement

Assistive devices to increase, maintain or improve functional capabilities of individuals with disabilities

Introduction: The overall goal for rehabilitation of people with disabilities is to improve the persons ability to perform and participate in daily activities. Assistive devices can be used to acheive these goals. An assistive device can range from simple equipment to highly advanced technology, but but where the overall aim is to prevent further disability, support the user's independence and opportunities for participation, and minimize the care burden for caregivers.

Material and methods: Focus will be on research about as-

sistive devices to increase, maintain or improve functional capabilities of individual with disabilities. What is the main device being used and was is recommendations. In the oral presentation, focus will be positioning in standing.

Results: What does the research tell us and what is the clinical recommendations for using assistive devices.

Key words: Assistive device, standing position, recommendations.



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The importance of the double product in the Six-Minute Walk Test to predict myocardial function

Introduction: The six-minute walk test (6MWT) is a widely used test to measure the physical performance of patients, assess the effectiveness of treatment, qualify for rehabilitation and evaluate of its effects. This paper focuses on the assessment of the growth of a double product (DP) during 6MWT and its diagnostic value in the assessment of patients with heart failure.

Materials and methods: The paper has retrospective character. We analysed medical records of 412 patients hospitalized for cardiac reasons, in whom a 6MWT was performed. The patients were divided into two groups: with diagnosed heart failure and a control group.

Results: There were no significant complications associated with the 6MWT in the patients. The patients with diagnosed heart failure were characterized by shorter walking distance

and greater DP increase at equal walking intervals compared to the control group. The mean DP increase corresponding to one meter of walk was the only one that correlated negatively with the left ventricular ejection fraction.

The assessment of the increase of the DP during the march test seems to be a better parameter reflecting the efficiency of the myocardium from the distance of the march.

Conclusion: 6MWT performed in patients hospitalized for cardiac reasons is a simple and safe examination. The best parameter that reflects myocardial efficiency in such patients seems to be the assessment of the average double product increase corresponding to a 1-meter walk.

Key words: the six-minute walk test, heart failure, double product



Dörner Oliver

Krankenhaus Winsen

Can you digitalize Physiotherapy? What are the problems with digitalization and how, if at all, does it affect physiotherapy and what do we have to do about it?

A great task of our time is the digitization. It is affecting everything in our life. It bears great problems and the concept of our life is questioned. Other countries have taken huge steps towards a loss of freedom. The freedom of each individual as

well as the freedom of our way to practice our daily work as well as the freedom of teaching. What are the good and what are the difficult chances of digitalization of physiotherapy? What do we have to do about it?



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Wydział Rehabilitacji Ruchowej AWF w Krakowie

The effectiveness of therapy for occupational voice disease

Introduction: A frequently observed health problem among people working with the voice is vocational failure “pseudo-phonastenia”. Determining the level of functional voice activity is important for the quality and effectiveness of interpersonal communication in everyday situations and verbal interaction of people working in occupations in which voice and speech are the basic tools of work. The aim of the study was to evaluate the results of the rehabilitation of voice disorders in selected professional groups.

Materials and methods: The study participants comprised 14 women between the ages of 31 and 48 (mean age, 39.42) professionally working with voice. The study group consisted of 6 primary school teachers, 4 physiotherapists actively conducting specialist courses and 4 actresses. All participants were subjected to an examination of the hyoid bone, the mobility of the larynx in relation to the mandible and in relation to the cervical spine were performed, the body posture was assessed, the phonation time was recorded and the breathing track was evaluated. A standardized Voice Handicap Index (VHI) scale was used. Respiratory and phonatory rehabilitation was performed and manual methods were used to lower the tension of the larynx muscles. The patients were examined twice be-

fore physiotherapy and after 2 weeks of individual exercise.

Results: In the first study, all women included in the study had an increased tonus of the neck muscles during phonation and an abnormal airway was observed. After the applied physiotherapy, the muscle tone of the neck during the phonation significantly improved in 6 (42%) patients, in 12 (85%) the change of the rib-diaphragmatic breathing track was registered. The MPT result in the first study was on average 17.4 s, while in the second 21.6 s. The results obtained with the VHI questionnaire before therapy were on average 14.14 points, and in the second study they decreased to 10.78 points on average.

Conclusions:

1. The tension of the neck muscles significantly influences the time of phonation.
2. The correction of the respiratory tract in people working with the voice positively affects its functional, emotional and physical aspects in the evaluation of the Voice Handicap Index scale,

Key words: rehabilitation of voice, phonation, occupational disease



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Medical needs including rehabilitation in Madagascar

Introduction: In November and December 2018, the authors participated in a charity mission in Madagascar, organized by their own forces by a group of Krakow doctors, with the support of the Africa Foundation for Africa. The mission allowed for a preliminary orientation in the health and rehabilitation needs of the people of Madagascar. Observations made during this mission, as well as conclusions resulting from them, constitute the content of this study.

Conclusions: 1. The health needs and help of international and charitable institutions for the inhabitants of Madagascar are almost unlimited in a country where there is no public, free health care. 2. These needs can only partly be met in this way. 3. Most residents do not have access to treatment due to its costs and distances.

Key words: Madagascar, health needs, mission



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The influence of gait in a high heel shoes on posture

Introduction: Wearing high-heeled shoes (HH) is a widespread model of behaviour among Western women, persisting in the popularity despite its harmful potential. Many studies examine the effect of high heel shoes on posture, but the results are very inconsistent. The aim of the study was ascertain the differences in posture at the very slow walking in HH. The study focused particularly on a group of women who are nonexperienced wearers HH.

Materials and methods: *Participants* - Thirty healthy females who only occasionally wear HH voluntarily participated in the study (age: 21.8 ± 2.09 years, weight: 55.7 ± 4.05 kg, height: 1.66 ± 0.03 m, Body Mass Index: 20.34 ± 1.41 , shoe size: EU 36–38). Exclusion criteria included previously musculoskeletal injury within 1 year and suffering musculoskeletal pain and none of the participants had injuries that could limit range of motion at the body and extremities.

Data collection - For postural measurement the SonoSens Monitor Analyzer system (Gefremed, Chemnitz, Germany) was used to observe the movements in individual sections of their spines as well as the participants' posture when walking. In a comparative experiment, the correlation between the

variables recorded when walking in two types of shoes - HH and 7 cm heels, flat shoes (FS); were identified. The subjects walked on a treadmill (inSPORTline Genesis, Slovakia) at the pre-set walking speeds of $v_1 = 3.5 \text{ km.h}^{-1}$ (slow speed) and of $v_2 = 2 \text{ km.h}^{-1}$ (very slow speed). These speeds were viewed from the perspective of the participants as most comfortable and safe. Speed v_1 was viewed as comfortable slow speed, v_2 as very slow. Shoes and speeds were selected randomly.

Results: The assessment of overall results showed statistically significant differences in the movement of the spine in the sagittal plane between walk in HH and flat shoes. Based on the total average of the median sagittal bending index (mSBI) values, it can be stated that HH affect the spine curvature in comparison to FS; HH straighten lordosis at lumbar spine and cervical spine and kyphosis in thoracic spine.

Conclusions: In the experimental conditions as defined above (mSBI; walking speed 3.5 km.h^{-1} and 2 km.h^{-1} ; 7 cm heel), it can be concluded that the median sagittal bending index while wearing HH changes significantly in comparison to that of wearing FS.

Key words: high heels shoes, slow walking, gait, posture



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Assessment of the ability to maintain static body balance in children aged 6–7 years

Introduction: The aim of the study is to assess the ability to maintain a static body balance in a standing position on one extremity in children at the age of 6–7 years.

Material and methods: Pupils from the first class from public primary schools in Wrocław took part in the study. Each participant of the study performed tests checking the equivalent abilities on the left and right lower extremities with open and closed eyes according to the research methodology of Sally Goddard.

Results: It was observed that about 3/4 healthy children aged 6–7 meet the time standards for children from abroad.

Conclusions: There is a need to conduct a study on a larger group of children and to define the time norms in which children can maintain static balance on one lower limb with both open and closed eyes.

Key words: balance, static, children



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Current methods on physic medicine in prevention and treatment of early and advanced symptoms of complications of obesity and diabetes

Introduction: Obesity and diabetes are civilization diseases of the 20th and 21st centuries. In Poland, diabetes affects about 6% of the population at different ages, and obesity concerns 18% of men aged 50+ and 16% of women of the same age (GUS 2014). These people may have health complications that affect quality and life expectancy. Metabolic disorders associated with hyperglycaemia and the metabolism of fats, proteins and carbohydrates cause, among others: micro- and macroangiopathy, degeneration and loss of peripheral nerve tissue and central nervous system. nerve damage, capillary endothelium, hyperkeratosis of the epidermis leading to the formation of diabetic foot syndrome, decreased activity and speed of skeletal muscle contractions, decreased lung ventilation and bone-joint system load which leads to increased risk of injury.

Aim of the work: Review of currently used procedures in the field of physical medicine and spa medicine in the prevention and/or elimination of symptoms associated with obesity and diabetes.

Materials and methods: Based on literature and own experience. Knowledge of early and advanced symptoms of the above-mentioned complications, leads to the determination

of basic principles and methods of prevention, prevention and treatment using treatments in the field of: thermotherapy, laser therapy, electrotherapy, electromagnetic fields in the field of radio radiation, ultrasounds, massage, hydrotherapy, balneotherapy and gymnastics treatment.

Conclusions: Toxicity of hyperglycemia developing over the years affecting the development of diabetes and increasing obesity requires:

1. Ensure the continuity and complexity of the use of treatments to prevent complications and reduce existing complications.
2. Optimization of the use of the contemporary potential of activities in the field of physical medicine and spa treatment.
3. Obligatory dissemination of information about the possibility of selection and application of the above-mentioned treatments.
4. Developing contemporary standards of conduct in prevention, prevention and treatment of complications in diabetes and obesity.

Key words: diabetes, obesity, complications, physical and spa medicine



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Comparison the level of sensory perception in children starting school education using the Southern California Sensory Integration Test (SCSIT) by Ayres and, based on the parents opinion, form of the Sensorimotor Questionnaire by Przyrowski

Introduction: Sensory Integration (SI) is the ability to record information from the external and internal world by the sense organs. A properly functioning process of sensory perception enables the recording, processing and merging of sensory impressions and the modulation of sensory information in the child's relationship with the environment. The aim of the study is to compare the subjective assessment of parents with the objective assessment of researchers regarding the level of sensory perception of children from the first classes of primary schools.

Materials and methods: The study included a group of 80 children (37 boys and 43 girls) aged 7.2 ± 0.35 years from the first class of primary school. The study was carried out in two primary schools in Wrocław in September 2018. The study protocol included: Southern California Sensory Integration Test - SCSIT according to J. Ayres (own study) and Sensorimotor Questionnaire according to Z. Przyrowski (completed by parents).

Results: The results were statistically analyzed in the Statistica 13.1 program (StatSoft, USA). The level of significance

was assumed at $p=0.05$. Quantitative variables are presented in percentages. It was observed in the SCSIT study that in 33.75% of first-class children there is a risk or disorder in the perception of the sense of touch. The most common disorders of touch sense perception were occurred at 21.25% of children in the assessment of graphesthesia and in the fingers identification in 15% of children. The results of the study by the Sensorimotor Questionnaire confirmed that 45% of parents indicated the sense of touch as the most frequent risk of SI disorders in their children. There were no statistically significant correlations between the parents' opinion and the results of the SCSIT study.

Conclusions: Based on the carried out examination the following conclusions was formulated: 1. Parents more often report to the tactile hypersensitivity of the child than it was found as the actual level of the need for touch stimuli which the child should have provided for their proper development. 2. It is advisable to carry out research on a larger population of children.

Key words: sensory perception, children, primary school

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Comparison of indicators evaluating the longitudinal arching of the feet of children in early school age – preliminary study

Introduction: Foot screening examination in early school children is conducted for preventive purposes. Conducting such study, early detection of irregularities in the construction of the feet is possible. The aim of this study is to assess the measurement reliability of the indicators used to assess the longitudinal arching of the feet used in the examination.

Materials and methods: The study was conducted among 216 children (104 boys and 112 girls) from 1 to 3 classes in primary schools in Wrocław. The average age of the examined children was 8.76 ± 0.73 years. For the static measurement of the foot arching in children a 2D podoskaner was used, which ensures high quality of the pictures taken. Two researchers independently from each other in the same picture calculated the Clarke index and the Sztriter - Godunowa (KY) index.

Results: The results were statistically analyzed in the Statistica 13.1 program (StatSoft, USA). The level of significance was

assumed at $p=0.05$. There were statistically significant differences ($p = 0.0018$) between the quantitative value of KY for the left foot of children, in measurements performed by two different researchers in the same photos. The differences in the qualitative assessment of the longitudinal arch of both the left and the right foot in the analyzes performed by both researchers depending on the index of foot arching was statistically significant ($p<0,002$).

Conclusions: During conducting screening tests, it is important to use measurement and diagnostic tools with the highest possible diagnostic sensitivity.

Key words: foot diagnostic, screening test, primary school

Key words: diagnostics, screening test, early school children

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Analysis of the children's ankle of trunk rotation from primary schools in Wrocław

Introduction: The use of a skoliometer in screening tests among early school children enables the detection of early functional spinal curvatures. The aim of the study is to assess the ankle of trunk rotation in primary school children.

Materials and methods: 540 children (274 boys and 266 girls) from 1 to 3 primary schools in Wrocław took part in this study. The average age of the examined children was 8.78 years. Measurements of the trunk rotation angle (ATR) were made with the Bunnell skoliometer during the forward torso slope in the standing position (Adams test). The analysis for quantitative variables calculated: arithmetic means, median, standard deviations and range of variability (minimum and

maximum values). The frequency of qualitative variables (percentage) was calculated.

Results: The analysis of the results of the conducted examination showed that the highest values of ATR > 7° were observed at the main thoracic level (Th₅-Th₁₂). At the Th₅-Th₁₂ level, the risk of occurrence of lateral curvature in children was 4.63%, and ATR > 7° was observed in 1.11% of children.

Conclusions: Early diagnosis of abnormalities in the position of the spine in children allows for the implementation of therapy and prevention of structural scoliosis.

Key words: ankle of trunk rotation, screening test, children



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Can an observational gait scale produce a result consistent with 3-dimensional gait analysis?

Introduction: In order to investigate whether a simple observational tool may be a substitute to the time-consuming and costly 3-dimensional (3D) analysis, the study applied Wisconsin Gait Scale (WGS), enabling assessment which is highly consistent with 3D gait parameters in individuals after a stroke.

Materials and methods: The study included 30 patients with hemiparesis after stroke. A 3-dimensional gait analysis was performed using the BTS SMART system. A video recording was done concurrently with 3D recording. Interpretation of the recordings and WGS-based gait assessment were performed by a physiotherapist. The analyses took into account six gait symmetry indexes calculated based on 3D assessment. Measurement of gait symmetry applied the most commonly used method – absolute index proposed by Robinson.

Results: It was shown that 3D symmetry indexes, related to Stance Time [s], Stance %, Hip FE ROM and Knee FE ROM may be described with fairly high accuracy using item questions of the WGS ($0.7 < |R| < 0.9$; $0.9 < |R| < 1$). The least satisfying results were found in the case of Step Length [m] SI – the value of determination index at a level of approx. 24%.

Conclusions: It was shown that information acquired based on the WGS can be used to obtain results comparable to those achieved in 3D assessment for selected SI of spatiotemporal and kinematic gait parameters. The study confirms that observation of gait using WGS, which is an ordinal scale, is consistent with the main aims of 3D assessment, therefore the scale can be recommended as a substitute tool in gait assessment.

Key words: gait; stroke; Wisconsin Gait Scale; symmetry index



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Evaluation of the distribution of lower limb load in people with hip osteoarthritis and after arthroplasty

Introduction: Osteoarthritis is one of the most common joint diseases. One of the methods of treatment of hip degeneration is arthroplasty. The aim of the study was to assess the distribution of lower limb load in people with osteoarthritis of the hip and after the hip joint endoprosthesis and the identification of differences.

Materials and methods: The research was carried out at the ANTHROPOS Centre in Busko Zdrój. The study involved 32 people (16 people with osteoarthritis of the hip and 16 after arthroplasty). A one-time evaluation was carried out on the Gamma dynamographic platform. The task of the patients was to keep the standing position on a stable ground with eye control. patients performed a 30-second trial. During the test, the percentage distribution of lower limb loads was checked.

Results: The calculated average load distribution did not show a significant difference between the two groups. For the group

after arthroplasty, the load distribution was 50.62%: 49.37% and for the group with osteoarthritis of the hip 49.75%: 50.25%. Taking into analysis the dominant limb, asymmetry was noticed. For example, in right-footed patients after right hip surgery the distribution of loads was on average 50.63%: 49: 37%, while before surgery 47.13%: 52.87%.

Conclusions:

1. It has been shown that there is an asymmetrical load distribution in people with limb osteoarthritis.
2. It has been observed that in patients after arthroplasty, the limb load distribution is close to symmetrical.
3. When planning a rehabilitation program for patients after arthroplasty, exercises should be taken to improve the symmetrical load distribution, e.g. using a dynamographic platform.

Key words: Osteoarthritis, arthroplasty, load distribution, dynamographic platform



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Evaluation of seniors' physical activity as a starting point for improving learning in active aging

Introduction: Physical inactivity are a significant problem in all the developed countries to the acceleration of morbidity and mortality.

Materials and methods: KEGA project no. 009PU-4/2018 «Evaluation of seniors' physical activity as a starting point for improving learning in active aging» aims to point out that regular physical activity improves the physical and mental health of seniors, promotes self-sufficiency, and thus positively influences the Quality of Life. We want to get the data we get on the basis of a pilot study that we will implement on a set of 60 mobile seniors over 65 years of age from home for seniors involved in the mobility program. For the purpose of carrying out research to measure the volume of motion activity, we use an objective evaluation of the amount of motion activity by a modern accelerometer method using the ActiGraph GT3X+. The Quality of Life of seniors will be evaluated by WHO's

questionnaire as WHOQOL - BREF and WHOQOL - OLD specific questionnaire for the elderly. The data obtained will be statistically evaluated.

Results: By research we want to contribute to the claim about the positive influence of physical activity on the functional ability of seniors. We assume that a regular 8-week exercise activity will positively affect all observed parameters in seniors.

Conclusion: Active aging means aging in health and being independent in activities of daily living. This is largely contributed to by regular physical activity that positively influences the aging process. Last but not least, the role of the project is to transfer the acquired knowledge to educational materials, which will serve to acquire the professional knowledge and practical skills of nursing and students of physiotherapy.
Key words: Physical activity. Senior. Outputs. Teaching. Education.

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Selected aspects of rehabilitation treatment for back pain

Introduction: Back pain represents a significant medical, social and, last but not the least, also economic problem. It affects mainly adults of working age, but the age limit is constantly decreasing.

Interest in a complex rehabilitation care is increasing. As the number of people with spine pain and troubles increases, the same way the importance of rehabilitation grows. Rehabilitation plays an important role in the treatment, but it is also an important part of prevention. Suitable rehabilitation therapy helps to improve the subjective difficulties, improves mobility, function of the spine and allows people to return to a normal productive life.

The main aim of the thesis research was focused on the assessment of the status of mobility-support system of patients arriving in rehabilitation centres. Other objectives were to evaluate the effect of physiotherapeutic treatment and to identify the risks of damage to the musculoskeletal system in relation to the back pain and quality of life. Furthermore, also to analyze selected psycho-social impacts such as level of anxiety and depression that may have some influence on the course of the entire process, including the physiotherapeutic treatment.

Materials and methods: Experiment file consisted of 60 patients of both sexes of working age with a diagnosis of VAS in the lumbar part of the spine. The sample consisted of 30 men and 30 women. The average age is 22 years of age, with

a variance from 22 to 62 years.

In the methodology of the research, we chose the standardized methods and questionnaires which are simple and time-saving provided that sufficient notice is given to the value. We used the questionnaire by MUDr. Hnízdil for the evaluation of the condition of musculoskeletal system, functional spine examination aimed at the global examination tests and Numerical range of aches and pains. For the quick evaluation of the labour and social fields for the purpose of the research we used Sheehan N Scale. We also used 2 validated tests: Beck Anxiety Inventory and Zung Self-Rating Depression Scale.

Results: The results confirm the disfavoured condition of movement system at selected patient sample. Statistically significant results were found in terms of improving treatment after rehabilitative treatment completing as well as in the monitored parameters of the spine mobility and during reduction of the back pain at the significance level of 0.001.

Conclusion: Back pain can be described as an epidemic of our time due to its significant rise in population. Being inexpensive prevention is of essential importance to avoid back pain. Prevention should be aimed on minimizing all influenceable disfavoured factors.

Key words: Back Pain. Vertebrogenic Algic Syndrome. Diagnosis. Treatment. Rehabilitation. Prevention



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Indications for the application of physical therapy, as composition pulmonological rehabilitation in bronchopulmonary diseases

Purpose: comparative analysis of the use of physical therapy in bronchopulmonary diseases.

Methods: analysis, generalization, systematization.

Results: The states in which pulmonary rehabilitation is applied according to the recommendations of the experts of the American Thoracic Society/European Respiratory Society (ATS/ERS) are conventionally divided into:

1. Obstructive diseases: COPD; persistent asthma; diffuse bronchiectasis; cystic fibrosis; bronchiolitis obliterans.
2. Restrictive diseases: interstitial lung diseases; interstitial fibrosis; occupational or environmental lung disease; sarcoidosis; connective tissue diseases; hypersensitivity pneumonitis; lymphangiomyomatosis; acute respiratory distress syndrome (ARDS) survivors; chest wall diseases; kyphoscoliosis; ankylosing spondylitis; posttuberculosis syndrome.
3. Other conditions: lung cancer; pulmonary hypertension; before and after thoracic and abdominal surgery; before and after lung transplantation; before and after lung volume reduction surgery; ventilator dependency; obesity-related respiratory disease.

In Ukraine, respiratory gymnastics and other FT drugs are also widely used in both chronic and acute bronchitis, and in

all forms of asthma. Restrictive disorders are considered in 2 different directions, namely, pulmonary diseases and diseases of the musculoskeletal system. There are no recommendations for the use of FT in the treatment of ARDS, lymphangiomyomatosis and hypersensitive pneumonitis. In Ukraine, FT drugs are used for lung cancer and surgical interventions. Respiratory insufficiency is considered as a pathological syndrome, and it affects the selection of FT methods and techniques. Obesity is considered in metabolic diseases, where breathing exercises are special.

Conclusion: The recommendations of ATS/ERS consider pulmonary rehabilitation to be appropriate in chronic respiratory diseases; diseases associated with elasticity and movement of the chest, posture and diseases of the respiratory organs associated with obesity. In the Ukrainian literature, there are no common recommendations for pulmonologic rehabilitation, but they are directly or indirectly prescribed in the treatment and rehabilitation of people with acute and chronic bronchopulmonary diseases.

Key words: physiotherapy, broncho-pulmonary disease.



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Edward Madeyski's precursory activities for the development of rehabilitation and hygiene in Lviv in the years 1870–1906

The authors, based on source materials and few studies, present the activities of Edward Madeyski for the development of rehabilitation and hygiene in Lviv in the years 1870-1906. In 1858 he graduated from the University of Vienna, where he obtained a master's degree in surgery. Wishing to combine the medical knowledge with his passion of gymnastics, he went on studying in Saxony. He familiarized himself with the German system of physical education and issues related to orthopedics and therapeutic gymnastics. The main purpose of the work is to present E. Madeyski's little-known activity in the field of rehabilitation which he was running since 1870 in his own Orthopedic Gymnastics Center in Lviv. He treated children with musculoskeletal disorders, mainly with spinal curvatures, with the help of physical factors (healing gymnastics, massage, orthopedic supports). From 1876, the facility had a guest house for the sick, in which children from distant locations could live. During the long-term treatment the chil-

dren were taught by the best Lviv educators.

In his scientific works Madeyski represented the health and hygiene school, was a supporter of "rational gymnastics". His work gave rise to the development of physical education theory, training of gymnastics specialists and activity of orthopedic and gymnastic institutions. He is one of the promoters of a healthy lifestyle and hygiene in Galicia at the turn of the 19th and 20th centuries. Madeyski's approach to gymnastics, as a physician and precursor of gymnastics, is a perfect example of the fusion of medical science and emerging physical culture sciences. In 1889, in recognition of his merits for many years of medical, pedagogical and scientific activity, the emperor awarded the title of Professor to him. E. Madeyski's precursory activity in Lviv in the years 1870-1906 made a significant contribution to the development of rehabilitation, hygiene and physical education in Poland.

Key words: history of rehabilitation, hygiene, physiotherapy



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Pain cuts cervical spine in people who work a static

Introduction: Cervical spine pain syndromes are one of the most serious problems affecting society, which significantly affect the quality of life. Sedentary lifestyle, lack of physical activity, stress, a small amount of sleep adversely affect the spine and may be the cause of disability.

Aim of the study: Analysis of the impact of a sedentary lifestyle on the occurrence of pain in the cervical spine.

Materials and method: The research was carried out in the Podkarpackie Voivodeship Office in Rzeszów and included a group of 119 employees. The research tool was a survey of the researcher's own design.

Results: The respondents work on average 7-8 hours a day, mostly not remembering about the correct posture at work in front of the computer. The majority of the respondents say that cervical spine pain occurs during work. The most numerous group of employees assesses the general state of their health as rather good.

Conclusions: Inadequate lifestyle, passive leisure time activities and sight defects affect the appearance of pain in the cervical spine.

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The importance of physiotherapy of children with Cystic fibrosis

Introduction: Cystic fibrosis is an inherited incurable disease that causes damage to multiple body systems. Part of the treatment is thorough care of the airway through not only the use of the necessary medications but also the regular exercise of respiratory physiotherapy.

Materials and methods: The group consisted of 25 pediatric patients. The age range of patients was 7-18 years, the mean age was 10.7 years (SD \pm 3.46). Of these, there were 13 (52%) girls and 12 (48%) boys. The research was conducted at the Physiotherapy and Rehabilitation Department of the National Institute of Child Tuberculosis and Respiratory Diseases, n. o. in Dolný Smokovec. In the research we focused on selected muscle groups, where we anticipated shortening or weakening as a consequence of chronic respiratory disease. We did Matthias's test for examining posture in children. From a dedicated spirometric examination, we selected the values of residual volume (RV), expiratory reserve volume (ERV), total lung capacity (TLC), and ratio of residual volume to total pulmonary capacity (RV / TLC). All described tests and

examinations were performed twice, at the beginning and end of the two-week treatment stay.

Results: The values obtained at the beginning of the stay were compared with those obtained at the end of stay and processed percentages and statistically by T - test. The results showed an improvement in muscle dysbalance, Matthias tests, oxygen saturation, increase respiratory amplitudes and all monitored parameters of respiratory function ($p < 0.01$).

Conclusion: Based on the results, it is clear that respiratory physiotherapy is an indispensable and indispensable component of complex treatment of patients with cystic fibrosis. Rehabilitation maintains ventilation parameters in standard, maintains breathing function, improves overall mobility and body resistance, reduces breathing and fear of movement, allows cough control and effectively cleans mucus, improves inhalation and prevents forced hospitalizations.

Key words: Cystic fibrosis. Respiratory Physiotherapy. Airway clearance techniques.



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Virtual reality in neurological rehabilitation

Introduction: Learning new motor skills is important to induce neuroplasticity and functional recovery. It has been shown that combining traditional rehabilitation with virtual reality (VR) promotes skills re-acquisition and stimulates neuroplasticity. Motor learning could be improved through training in an enriched environment focused to optimize the interactions between the motor system and the physical environment. Literature reports that VR is effective for the re-

covery of motor function and has emerged as new treatment approaches in stroke rehabilitation settings. VR allows to provide specific treatment artificially augmenting the sensory information coming from the external environment. VR can incorporate elements necessary to maximize motor learning, such as repetitive and differentiated task practice or feedback of performance and results.

Key words: virtual therapy, stroke, reinforced feedback



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Activity level of students at Rzeszow University and their knowledge level about colorectal cancer risk factors

Introduction: It has been observed that physical activity reduces the risk of colon cancer. The main objective of the work was to assess the physical activity of UR students depending on the gender and field of study and to check their level of knowledge about the factors affecting colorectal cancer.

Materials and methods: The research was conducted among 279 students of age 21-23, of three fields at Rzeszow University (Physiotherapy, Physical Education and Economics). The research was based on International Physical Activity Questionnaire (IPAQ) which assesses the level of moderate and intense physical activity in the last 7 days and an own questionnaire, that provided data on knowledge about colorectal cancer.

Results: the largest energy expenditure related to the activity of an intensive and average intensity/exacerbation was noted

in the case of Physical Education students; the lowest among the Physiotherapy students. The most knowledgeable about colorectal cancer were students of Physiotherapy (88,79%) and students of Physical Education (74,13%); the least knowledgeable were students of Economics (43,29%)

Conclusions:

1. The study group had an average level of knowledge about colorectal cancer.
2. Physiotherapy and physical education students have the best knowledge about the factors affecting colorectal cancer, which may be related to subjects during their studies
3. Physiotherapy students had the highest knowledge about the risk factors of colon cancer, although their physical activity among the students of the three fields of study was the lowest.

Key words: cancer, colon, physical activity, risk factors



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Post- polio syndrome

Post-polio syndrome (PPS) affects people who previously had polio disease (poliomyelitis), acute common paralysis cerebri infantum or spinal paralysis.

It is observed in about 80% of patients with polio diagnosed in the past. The risk to get ill is much higher when the type of the primary disease was more severe. The first symptoms may appear on average 35 (15-70) years after the infection with the poliomyelitis virus, so it usually affects people in the elderly, often getting worse after even a minor accident - eg falling, lying down in bed for long time, or surgery. According to the WHO, the post polio syndrome affects about 20 million people around the world. Acute common paralysis cerebri infantum attacks mainly the motor cells of the spinal anterior horn in the cervical and lumbar sections of the spine. It attacks mainly young children. It manifests as an asymmetric paresis or flaccid paralysis of skeletal muscles. For the first time the polio was described in detail by the German physician Jakob Heine (1840) and by the Swede, Karl Oskar Medin (1890). The last massive epidemic of Heine-Medin's disease took place in the 1950s.

A characteristic feature of the post-polio syndrome is occurring by the new process of both muscles affected by paralysis in the period of acute illness and muscles, which seemed to be undamaged. The period between the acute phase of polio and the development of new symptoms lasts about 20-40 years, so people affected by the disease are usually between 50-70 years old. The worst therapeutic problem is the intensifying the disability. These people, thanks to rehabilitation, were professionally active for many years, founded families and unexpectedly at some time started to feel symptoms that complicated their functioning. There are no specific therapeutic methods for post polio syndrome, only symptomatic treatment can be used. However, the procedure should take into account both the symptoms of the post-polio syndrome, as well as the accompanying other diseases associated with overloading of the osteoarticular system and associated diseases. The main goal is to maintain physical fitness as long as it is possible.



Klemm Johannes

Krankenhaus Winsen

Difficult and delicate problem made easy

The Levator ani in the treatment of incontinence.
What is the role of the levator ani incontinence and what
kind of treatment option are there especially in physiotherapy?

The lecture discusses different treatment principles in this
complex problem?



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Movement pattern and pain intensity assessment in TMJ physiotherapy

Introduction: Differential diagnosis in dysfunction in Temporomandibular joint (TMJ) has a very important role in determining the treatment procedures. As the symptoms of patients are manifested without differences despite the different causes, such as pain in the area of TMJ, mandible, surrounding muscles, there is also limited ability to move while eating, chewing, swallowing, verbal expression and face facial. The number of patients is currently estimated at about 20% of the population with TMJ disorder, while the ratio of women and men is 4:1. The objective of study was to point out the importance of physiotherapy for temporomandibular joint dysfunctions.

Materials and methods: In this study, we present a set of 64 patients with the diagnosis of Temporomandibular joint dys-

function in the range of age 13-80 years and an average age is 52,79 years. We evaluated mouth opening range status and the pain intensity before and after the completion of physiotherapy for a period of 21 days.

Results: The result of treatment procedures is the reduction in pain intensity, reduction in muscle tension in the TMJ area, and we have also restored the range of TMJ mobility together with the physiological mouth opening.

Conclusion: The analysis of the results shows us the importance of differential diagnosis in Temporomandibular joint therapy and its important role in successful TMJ therapy.

Key words: Pain intensity. Temporomandibular joint. Physiotherapy.



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Knowledge relating to food supplements among general public

Introduction: It is well recognized that diet and physical activity play important roles in maintaining health and preventing diseases. The aim of this research was to assess subjective and objective knowledge about diet and supplementation in sport of people living in south-eastern Poland.

Materials and methods: The research was carried out in the south-east of Poland between October 2017 and July 2018 during the three events, which organized the University of Rzeszów. Initially, the study covered 500 people. During the preliminary analysis, 90 people were excluded from the study because they did not meet the previously well-explained rules of conduct during the study or did not meet the eligibility

criteria for the tests. The survey method was a questionnaire with the option of choosing only one answer.

Results: Our research show that there were statistically significant dependence between the sex and the people who engaged and did not engage in physical activity and their knowledge about the diet and supplementation in sport.

Conclusion: There is a high prevalence of supplement use in our study population, but many do not have accurate information about these products. Hence, there is an urgent need to provide the community with education and access to scientific and unbiased information.

Key words: diet, supplementation, sport



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Psychotherapy in neurorehabilitation

Introduction: Neurological diseases and their symptoms are closely related to somatic and psychological functions. Long-term irregularities in the functioning of neurological patients include not only motor dysfunctions, but also psychological - both cognitive and emotional. Depression and anxiety are the most common symptoms. Therefore, there is a need to apply specific procedures for the treatment of psychological symptoms that accompany neurological disorders. The most commonly used treatment in this case is pharmacotherapy. Unfortunately, it is often insufficient, and what is more, there is no long-term effect, such as psychotherapy. Psychotherapy, in addition to the clinical improvement of patients, has the potential to change the central nervous system - its metabolic and synaptic activity. The aim of the presented review of the literature was an attempt to emphasize the significance of psychological interactions, especially psychotherapy in the process of rehabili-

tation of neurological patients.

Material and methods: Literature review included articles of scientific publications on neurological rehabilitation, psychotherapy and neuropsychology.

Results: Psychotherapy and other psychological actions seem to be indispensable elements of the neurological rehabilitation process. However, there are very few studies on psychotherapy in neurorehabilitation that would give specific indications for this process.

Conclusions: Psychotherapy can be used as another important element in the rehabilitation of neurological disorders, due to their psychological symptoms. It would be reasonable to attempt to determine the appropriate psychotherapeutic indications and methods - adapted to a given disease, but also to the process of its rehabilitation.

Key words: neurological rehabilitation, post-stroke depression, psychotherapy



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The relationship between patients and the physiotherapist in the physiotherapeutic treatment process

Introduction: Expectations towards physiotherapists among patients already participating in the physiotherapeutic treatment process are very wide - starting from obtaining broadly understood information support, through proper physiotherapy, and sometimes even emotional support. Studies show that the expectations before treatment differ from expectations after treatment and can influence physiotherapy and its effectiveness. However, there are small number of studies addressing the expectations of physiotherapists, and thus the physiotherapy process, in the general population. The aim of the study was to determine the expectations of behaviors desired from physiotherapists, including sociodemographic determinants. The study was conducted via the Internet. Women and men

aged 19 to 64 were participated. The Patient-Physiotherapist Expectations Questionnaire (PPEQ) and the sociodemographic survey were used.

Studies have shown that there are statistically significant differences in the expectations of physiotherapists depending on the sex of the subjects. Women more often than men declare the need for emotional support. They also expect a greater understanding of the experienced problems.

Knowledge of patients' expectations towards a physiotherapist can help to plan physiotherapeutic treatment in such a way as to increase the effectiveness of its impact.

Key words: physiotherapists, expectations, women, men



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The effect of kinesitherapy on fatigue in patients during radiotherapy

Introduction: Chronic fatigue syndrome occurs in 70-100% of patients undergoing oncological treatment. One of the methods to combat fatigue in cancer patients is physical activity.

Materials and methods: The study included 40 patients treated at the Clinic Radiotherapy Oncology, Supcarpatian Centre of Oncology Rzeszow. The patients are scheduled to perform general exercises during radiotherapy.

Before starting the treatment, the patient filled out a questionnaire containing demographic data and assessment of physical activity, additionally a BFI questionnaire was used. To assess the effect of kinesiotherapy, a general up&go fitness test was used, the measurement of which was noted at the beginning and at the end of treatment.

Results: Statistically significant ($p = 0,019$) positive correlation ($r = 0,370$) between age and fatigue was observed. Women felt subjectively more fatigued compared to men respectively 4,5 vs. 4,3. The average level of fatigue in people performing

hard work did not differ significantly compared to people who performed work at moderate intensity on average 4,4 vs. 4,4. During radiotherapy and after the kinesitherapy, an improvement in the up&go test was obtained (mean = 9,6) compared to the period before exercise (mean = 9,9). In the BFI test, a greater level of fatigue was observed in palliative patients according to radically treated patients 4,9 vs. 4,1.

Conclusions: Research shows that the feeling of tiredness grows with age. After completion of the kinesitherapy, slightly more fatigue was found in women and patients treated with palliative care. Body weight did not affect the feeling of fatigue. Patients performing high intensity housework were more tired than moderate patients. As a result of the general improvement exercises, an improvement in the overall efficiency of the patient was achieved according to the up&go test.

Key words: Cancer-related fatigue, kinesitherapy, radiotherapy.



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The Influence of Active Sport on the Athlete's Posture

Background: Current top sport has reached the stage where it is important to achieve maximum performance at the cost that the athlete's physical load is exaggerated and often little compensated by activity eliminating the adverse effects of training or sporting performance itself. Ultimately, it will reflect on the quality of the locomotive system or, posture.

Aim: The aim of this work is to find out the presence of truncated muscles, to monitor posture, movement stereotypes, and to diagnose spinal curvature and mobility of segments in the sagittal plane in top athletes, and to compare these parameters among a groups of athletes who actively play football and basketball.

Materials and methods: Top athletes (n = 60 men, age 20 ± 2.9) participated in the survey, of which 30 were footballers and 30 basketball players had been active for at least five years.

To meet the research aims, we used a shortened muscle test and a movement stereotype test according Janda, a postural test, and a Spinal Mouse diagnostic appliance. The obtained results are statistically processed.

Conclusion: Among the active players of football and basketball in the monitored parameters (shortened muscles, kyphosis, movement stereotypes, segmental mobility) we found out statistically significant differences ($p < 0.05$). At active basketball players are more frequent shorter muscles, increased kyphosis, worse movement stereotypes, worse segmental mobility, and spine curvature in Th area. At football players they occur mainly shortened hip joint flexors and posture disorder in the pelvis and trunk area.

Key words: Basketball, Football, Mobility, Posture



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Changes of Gross Motor Function in Patients with Cerebral Palsy during Treatment by Intensive Neurophysiological Rehabilitation System. Professor Kozyavkin Method

Introduction: Changes of gross motor function during the course of intensive neurophysiological rehabilitation were studied in 61 patients with spastic forms of CP at the age of 2 to 15 years.

Materials and methods: All patients were examined before and at the end of a two-week course of treatment, using the Gross Motor Function Measurement GMFM- 66 Item Sets test to calculate of scores of motor development.

Results: Statistical analysis indicated a significant increase in the level of motor development of children after treatment from 45.1 to 47,6 ($p > 0.01$). The most significant progress was

noted in patients at level II of Gross Motor Function Classification System. The score of motor development has increased from 66,2 to 69,6 with a difference of 3,42 points ($p < 0.01$).

Conclusions: The results suggest the effectiveness of Intensive Neurophysiological Rehabilitation System for the improvement of gross motor functions in patients with cerebral palsy. It is necessary to continue this study and conduct blinded randomized clinical trial according to the requirements of evidence based medicine.

Key words: cerebral palsy, movement disorders, Intensive Neurophysiological Rehabilitation System , rehabilitation



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Influence of the spinal manipulation on muscle spasticity in cerebral palsy: randomized controlled trial

Introduction: Muscle spasticity is an important clinical syndrome of Cerebral Palsy (CP). Recent research indicates possible influence of spinal manipulation (SM), a therapeutic intervention in which a low-amplitude high-velocity impulse of force is applied to the spinal joints, on muscle spasticity. The aim of our study was to investigate the short-term influence of SM on wrist muscle spasticity and manual dexterity in CP patients in a randomized controlled trial

Materials and methods: After baseline examination, 78 subjects with spastic CP (7-18 y) without contractures or hyperkinetic syndrome were randomly allocated into two groups. Experimental groups underwent SM, control group – imitation of the manipulation. Second evaluation was performed 5 min post intervention. Wrist muscle spasticity was gauged quantitatively with Neuroflexor, a device measuring resistance

to passive movements of different velocities. Manual dexterity was evaluated by Box & Blocks test. Nonparametric statistics were used.

Results: In the experimental group muscle spasticity reduced by 2.18 newton: from median 5.53 with interquartile range (IR) 8.66 to 3.35 (IR=7.19), the difference was statistically significant ($p=0,002$). In the control group reduction in spasticity was negligible. The between-group difference in change of muscle spasticity was statistically significant ($p=0,034$).

Conclusions: Study indicates that SM causes reduction of spasticity in patients with CP. Long-term effects of spinal manipulation on muscle spasticity have to be studied.

Key words: cerebral palsy, spinal manipulation, muscle spasticity.



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Hydrobalneological procedures in the prevention and treatment of cardiovascular disease

Introduction: Cardiovascular disease is the main cause of mortality worldwide and constitutes a serious clinical and social problem.

The aim of a study is to present the possibility of using selected hydrobalneological procedures in the prevention and treatment of cardiovascular disease.

Materials: The paper presents treatment outcomes of 50 patients with grade 1/2 hypertension who underwent a series of procedures involving water jets at alternating temperatures and the clinical presentation of a patient with lower limb obliterating atherosclerosis and necrotic changes, successfully treated with carbonic acid baths.

Results: After treatment with water jets at alternating temperatures, the blood pressure of patients with hypertension returned to normal. After 3 months of treatment with carbonic acid baths, a subject with necrotic limb changes caused by atherosclerosis achieved blood supply normalisation.

Conclusions: 1. Selected hydrobalneological procedures may be more widely used to prevent and treat cardiovascular disease. 2. There is an urgent need to promote the use of these procedures, both among doctors and the general public.

Key words: cardiovascular disease, prevention, hydrobalneological procedures



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Physiotherapy in HIV-positive patients / AIDS case demonstration – prophylaxis principles

Introduction: The first cases of the disease known as acquired immune deficiency syndrome (AIDS) were described in 1981. According to the WHO, more than 35 million people worldwide have been diagnosed with HIV since then. The number of HIV-infected individuals in Poland is estimated at 35 000. The disease is associated with changes involving, among others, the central and peripheral nervous system and the musculoskeletal system. Patients are referred for physical treatment due to lower limb paresis, disturbed sphincter function and coordination as well as acute articular pain.

Material and methods: The paper presents physical treatment and rehabilitation conducted in HIV-infected patients with these problems. The principles of preventing HIV infection in the staff of the Division performing the procedures are also described together with HIV infection prophylaxis.

Conclusion: The principles of prevention and timely preventive measures may help the staff avoid HIV infection.

Key words: HIV/AIDS infection, physiotherapy, principles of prevention



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Fatigue accumulation during chemotherapy in patients with diagnosed lung cancer – initial research

Introduction: Fatigue accumulation is a chronic feeling of tiredness in ill patients, which can be associated with malignancy as well as its treatment result. One of the methods of rating the intensity of tiredness is the Brief Fatigue Inventory (BFI) questionnaire. The aim of this thesis is the evaluation of fatigue accumulation in patients receiving chemotherapy.

Material and methods: 24 patients with diagnosed lung cancer who have been receiving chemotherapy at the Oncology Clinic in Rzeszow Oncology Centre have participated in the research. These patients have been receiving 3-day chemotherapy every 21 days. Before each chemotherapy course they filled in a questionnaire with demographical data, answered questions about tiredness and BFI questionnaire. Patients' efficiency has been scored using Karnowsky's scale and stage of disease.

Results: There were 7 women (29,2%) and 17 men (70,8%) among the evaluated patients. The average age of subjects was 65,4 years old. The results have been statistically analysed. The rate of fatigue before the 1st course has been classed as moderate with 15 patients (62,5%), and as mild with 9 of them (37,5%). In relation to the treatment received, moderate fatigue level has been identified with a higher number of

patients compared to a mild one, post-treatment: 22 people - 91,7% vs 2 people - 8,3%, consequently. According to the BFI questionnaire an increased fatigue level has been observed in each of the chemotherapy courses: 4,0, 4,5, 5,4, 5,0 accordingly. Patients have subjectively rated the 3rd course as intensification of the fatigue level during chemotherapy treatment - 11 (45,8%).

Conclusions: A higher level of fatigue has been observed during chemotherapy treatment. The stage of disease or evaluation based on Karnowsky's scale has not influenced the fatigue. The age of the patients has not had any impact on fatigue rate in any of the treatment courses. During the 3rd course, patients above 65 years old have observed a higher impact of fatigue on their walking ability. A difference in experiencing fatigue by gender has been identified in various chemotherapy cycles. The loss of weight has not had any effect on fatigue level. Further research on an increased number of patients is advised.

Key words: Fatigue accumulation lung cancer, chemotherapy, BFI



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Association between body mass index and results of rehabilitation in patients after stroke – a 3-month, follow-up study

Introduction: Stroke is estimated to affect 24–54% of the global population and is one of the leading causes of death. According to the World Health Organization over one billion people worldwide have excessive body weight, and approximately 300 million people are obese. The major consequences of obesity in adults include metabolic syndrome and cardiovascular diseases.

Purpose of the study was the assessment of the relationship between body mass index and results of rehabilitation in patients with stroke.

Material and method: The study was carried out from June 2015 to March 2017 at the Clinical Rehabilitation Ward with Early Neurological Rehabilitation Unit, at the Clinical Hospital in Rzeszów (Poland). The examinations were performed three times. Based on inclusion and exclusion criteria, 128 subjects were qualified for the first examination (carried out at admission of the patient to the ward). The second examination (at the end of five-week rehabilitation program) involved 114 subjects and finally 100 patients with stroke participated in the third examination (a follow-up three months after the end of the rehabilitation). The subjects' height was measured with the stadiometer PORTSTAND 210. Body mass was examined with an accuracy of 0.1 kg, using body composition analyser MC – 780 MA, manufactured by Tanita. Body Mass

Index (BMI) was calculated for all the subjects. Effects of rehabilitation were assessed with Barthel index, Berg scale, Ashworth scale, and Brunnström scale.

Results: The patients' functional condition was found to be significantly better during Exam II, compared to Exam I. The subjects identified as overweight before rehabilitation presented greater gains as a result of arm rehabilitation, as measured by Ashworth scale (mean = 0.35 ± 0.54), compared to the obese subjects (0.03 ± 0.32). No statistically significant difference were observed in the scores obtained using the scales, relative to the patient's body mass category (overweight/obesity). It was shown that at the follow-up, three months after the end of the rehabilitation, significantly higher scores in Ashworth scale for the upper limb were obtained by the overweight (0.28 ± 0.55) compared to the obese patients (0.04 ± 0.34)

Results: Following hospital-based rehabilitation, patients with normal body mass achieved greater functional efficiency. The findings also show a trend towards normalisation of BMI. The positive effect of rehabilitation was sustained for three months (Exam III), which may contribute to decreased risk of cardiovascular diseases and complications such as stroke.

Key words: stroke, BMI, Barthel index, Berg scale, Ashworth scale, Brunnström scale



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Physical therapy for children with trisomy 21

Background: Physical therapy for children with trisomy 21 should be based on good parental communication with the child and specialists and on supporting psychomotor development.

Communicating psychomotor and sensomotor development in a way that is safe for the child and his parents is essential.

Parents of children with Down's syndrome should be provided with up-to-date information on trisomy 21. For example, about sciatic nerve stimulation, diet, life expectancy, psychomotor development. Researchers agree that physical fitness in children increases the volume of gray matter, which implies improved speech and reading skills.

We conducted a study to check whether there is relationship between motor skill, intellectual disability and balance.

Materials and methods: 79 children with DS. The research took place in Greater Poland region, among patients with Down syndrome of The Poznań Center of Rehabilitation and Orthopedic, The "YES" Association and Polish Association

of Mental Retarded People "Kolo" in Leszno.

Gross Motor Function Measure-88 (GMFM-88), Pediatric Balance Scale was used to check motor function, body balance. Psychological diagnosis served to determine the degree of mental development using the Brunet-Lezine Scale and the Wechsler Intelligence Scale for Children (WISC)

Results: There was statistically significant difference of GMFM-88 scores depending on degrees of mental retardation ($p=0,043$). A very high, positive, statistically significant correlation was found between the body balance score and the GMFM-88 motor score ($r = 0.7, p < 0.0001$).

Conclusion: Children with profound degree of mental retardation present worse score of motor abilities than children with mild or moderate degree of mental retardation. Body balance scores are better among children with DS with better scores in gross motor function measurements.

Key words: Down syndrome, psychomotor development, body balance

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The effect of physical exercise on changes of the axial system in young athletes

Introduction: The aim of the study is to demonstrate the influence of sports training to changes of the axial system in young athletes.

Materials and methods: Study group was consisted of sportsman of the Sports Club in Presov and Kosice (Slovakia). The study involved young people who regularly participate in sports training (gymnastics, swimming, tennis, water polo, football). In the examined group of athletes $n = 75$, were 45 boys and 30 girls, average age 14.3, $SD \pm 1.1$ years). By using Spinal Mouse[®] there was realized assessment of the curvature of the spine in the basic position in the sagittal plane and frontal plane and mobility of the in different sectors.

Results: The research results show the greatest changes in the basic position in the sagittal plane (18.3%) and in the frontal plane (30.6%) of the thoracic spine in both investigated groups of athletes. In the basic position the greatest changes in the examined group were observed in the sagittal plane of the

thoracic spine. As many as 10.7% have had flat back, 18.3% of athlete have had hyperkyphotic position of the thoracic spine. In the lumbar spine sector hyperlordotic curvature have had 16.0% of athletes. Reduced curve in this sector spine was diagnosed in 12.0% of athletes. In assessing the mobility of the spine in flexion and extension, the largest deviations were observed in the pelvic inclination and mobility of the hip joints. In the frontal plane in the thoracic spine 30.6% of athletes were diagnosed with pathological curvature.

Conclusions: The results point to the many changes in the quality of the axial system of young athletes. Unilaterally applied sporting activity can cause serious defects in posture adolescents, as demonstrated by the results of our research. In the training process it is necessary think about the compensatory exercise and general regeneration.

Key words: Posture, SpinalMouse[®], axial organ, athletes.



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Assessment of repeatability and consistency of measurements assessing cervical range of motion with CROM goniometer

Introduction: The study was designed to assess repeatability and consistency of measurements assessing cervical range of motion with CROM goniometer.

Materials and methods: The study involved 30 healthy individuals (8 males and 22 females) aged 20-24 years. Two raters assessed cervical range of motion using CROM goniometer. Repeatability of measurements was determined by comparing the results obtained by one rater during the first examination; assessment of consistency was performed by comparing results obtained by the two raters. Assessment of consistency was conducted two weeks after the first examination.

Results: Measurements performed during the first session were found to present good repeatability in assessments of right and left rotation (Cronbach's alpha = 0.44). On the other hand two weeks after the first examination, good consistency was identified in measurements of flexion (0.50) and right rotation (0.09).

Conclusions: Assessment of cervical range of motion, performed by one rater, makes it possible to obtain good repeatability and reliability of measurements.

Key words: motion range, cervical spine, goniometer



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Impact of NHT on the quality of life in patients with lung cancer – the first report in the world

Abstract: The aim of the paper was to compare the effectiveness of standard breathing exercises (SBE) with NHT and to analyze the impact of the methods used on the quality of life in patients with lung cancer.

Materials and Methods: The study included patients treated for lung cancer. 52 patients were enrolled in the NHT treated group and 52 patients in the control group, where SBE was conducted exclusively without the use of training equipment. The quality of life was evaluated twice before the first and

three weeks after the third cycle of chemotherapy with QLQ C30 and QLQ LC13.

Results: The quality of life in the patients after the therapy improved in both the study and control groups. This manifested itself in particular in reduction of fatigue and pain in patients in the study group and improvement of physical functioning in both analyzed groups.

Key words: SpiroTiger, lung cancer rehabilitation, NHT



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Evaluation of the influence of neurosensory integration of MNRI reflexes on the functioning of children with autism with the simultaneous analysis of QEEG quantitative records

Introduction: Autism is a multiform disorder with unexplored etiology. Therapeutic treatment is therefore symptomatic, and due to the complexity and variety of symptoms must be individualized. The MNRI method (Masgutova Neurosensorimotor Reflex Integration) is focused on stimulation of deep sensation and proprioception, stimulation and integration of reflex patterns, motor coordination systems, behavioral regulation, emotions and cognitive functions.

The aim of the work was to apply MNRI therapy for children with autism and quantitative analysis of QEEG records.

Materials and methods: The study involved 60 children, aged 5-15 years ($M = 10.7$), diagnosed with autism (F84.0, according to ICD-10). Each participant of the project took part in the 11-day rehabilitation process according to the MNRI program containing 66 hours of therapy. The ATEC questionnaire, MNRI reflex patterns and QEEG analysis, before and

after MNRI were used to evaluate the effectiveness of therapy.

Results: Analysis of the results using the ATEC questionnaire showed improvement in functioning and reduction of symptoms of autism in 43.5% of the examined. Exercises in terms of MNRI reflex schemes have improved the sensory reactions regarding the regulation of tactile, sound, taste and motor sensitivity. At the same time, the applied cycle of exercises resulted in the improvement and normalization of 95 of the 380 analyzed parameters of the brain, mainly for the frontal, central and temporal areas.

Conclusions: Based on the obtained results, the authors believe that MNRI therapy can be used to improve children with autism as demonstrated by the use of the ATEC questionnaire, reflex regimens and QEEG neurophysiological studies.

Key words: neurological rehabilitation, autism, sensoryism, MNRI.

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Dynamics of health status of schoolchildren in Ukraine, according to a questionnaire survey

Topicality: In recent decades the health status and physical development of the children's population of Ukraine is deteriorating. Among the factors contributing to the decline in child health, an important role for the workload stress, which level leads to the development disadaptative syndrome with neurotic reactions of varying intensity.

Materials and methods: Based on Lviv city schoolchildren survey in 2002 (20 000 schoolchildren), 2013 (32 000 schoolchildren) and 2017 (70 000 schoolchildren) presents a comparative analysis of age-specific incidence of major complaints and symptoms, medical and social features of pupils of 1-11 classes.

Results: The health of schoolchildren in recent years has no tendency to improvement.

In 2002, 96,5% of parents of Lviv city thought that their children are healthy, while in 2012 - 81,9% and in 2017 - 76,08%. 8,1% of parents noted the presence of chronic diseases in siblings of children interviewed.

The daily consumption level of nutrients and caloric security in the majority of schoolchildren doesn't correspond to modern recommendations. Characteristic is the increased consumption of protein, significant calorie diet, excessive daily intake of saturated fat and cholesterol with inadequate intake of polyunsaturated fats, some vitamins and micronutrients. A significant number of schoolchildren determined by the combined deficiencies of vitamins and minerals.

The most frequent are the complaints of schoolchildren on abdominal pain, heartburn, nausea, headache, loss of appetite, symptoms of autonomic lability and asthenic syndrome other symptoms of school disadaptation, which is probably associated with a high school workload inadequate nutrition, the influence of stress factors on the background of a significant reduction in physical activity of schoolchildren.

Parents of students concerned about the prevalence of teen drug and alcohol abuse. The main reasons for this phenomenon, they considered the influence of the social environment and friends (20,8%), the relative availability of drugs and alcohol (16,8 %), lack of fighting the spread of drugs and

alcohol (11,8%), errors in family education (11,4%), social problems and the related psychological state of uncertainty, depression (10,2 %), the popularization of this phenomenon, the TV (7,9%), problems of spending free time (7,6 %), a way of self-affirmation of youth (6,3 %), low social and educational status (3,4%), unresolved domestic problems (3%)

Only 76% of parents regularly discuss with children the life and school problems, is rapidly increasing the number of children who prefer communication on social networks.

Almost half of students (42,9 %) are dissatisfied with their appearance, figure. About one-third of parents say kids have problems with vision, 20.3% were malocclusion, 20% – a violation of posture. Signs of scoliosis noted in almost every fourth child graduating classes.

Conclusion: Analyzing the survey data it can be argued that over recent decades the health status of pupils of Lviv has no tendency to improvement. Among the factors that contribute to declining child health, an important role belongs to the significant school load stress level which leads to disadaptative syndrome with neurotic reactions of varying severity.

This contributes to the unfinished reform of health care, lack of routine clinical examination and appropriate social educational programs. A screening survey of schoolchildren, which is conducted on a significant sample of students allows to determine the main medical and social characteristics of schoolchildren's life, to assess age-related prevalence of main complaints and threatening symptoms, the main trends in their habits, identify the risk group for further in-depth examination.

An integrated approach to the assessment of the health status of children, the introduction of new health technologies, combining efforts of health workers, teachers and parents can provide the ability to prevent the growth of functional disorders and organic pathology in schoolchildren, their chronicity, reduce symptoms, school maladjustment, to increase the level of schoolchildren's health and their learning abilities, and also to prevent the development of diseases in adulthood.

Key words: schoolchildren, health, diseases.



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Use of developmental kinesiology features in the rehabilitation of patients with paresis nervus facialis

Goal: Goal of the pilot study was to point at the significance of rehabilitation methods with use of developmental kinesiology features for treatment of patients with paresis nervus facialis.

Characteristic of the study: The examined group consisted of 3 patients with verified diagnosis of peripheral paresis nervus facialis, with stagnant and non-improving functional status despite standard treatment. Patients were sent from various neurological ambulances, examined by rehabilitation doctors of UNLP in Košice and treated at the clinic of FBLR UPJŠ and UNLP in Košice from January 2017, while their treatment is still ongoing.

Materials and methods of the research: Within the research part of the study, we used method of qualitative research in the form of casuistries. During the complex rehabilitation care which lasted approximately 4 months, we focused on the modification of orofacial disorders. Except the standard therapeutic procedures, we also applied developmental kinesiology features. We were evaluating the working condition of motoric functions before and after the therapy with the help of the muscle test by Janda.

Results of the research: After taking part in the therapy of complex rehabilitational intervention, with the use of developmental kinesiology features, the motoric responses of monitored patients with peripheral paresis nervus facialis, have improved (facial mimics, communication and devouring).

Conclusion: Main task of the pilot study was, within examined sample of patients with paresis nervus facialis, to highlight the importance of the treatment with the help of contemporary rehabilitational methods. Targeted use of the developmental kinesiology features in the complex treatment of the patients suffering from this diagnosis seems to be useable in practice, since we managed to improve patients' functional condition in orofacial area with positive effect after one-year stagnation. However, in order to confirm the functionality of this method, it is necessary to enlarge the sample of patients and to extend the research in near future.

Key words: peripheral paresis nervus facialis, developmental kinesiology, rehabilitation.



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Physical activity of children and adolescents in selected age groups

Introduction: The goal of the paper is the quality and quantity evaluation of the level of physical activity among the students of the primary school, middle school and high school in the area of lublin and podkarpackie.

Materials and method: The survey was conducted at schools in the towns of Krasnystaw, Zamość and Rzeszów. The study involved 270 students, 148 girls and 122 boys attending the sixth grade of the primary school, third grade of the middle school and third grade of high school. The research tool was the survey of own design, containing 23 questions.

Results and conclusions: In the study group 95% of students said that physical activity has a significant influence on health of young people. Boys spend more time on physical activity outside the physical education classes. At the turn between the primary and medium school, there was observed a gradual increase of physical activity, while between the medium and high school its decrease. In terms of the time spent on

physical activity, they most frequently pointed to 3-6 h and under 3 h a week. Most students, who are active outside physical education classes did several sports at the same time. The most preferred sport was the team sport. People from the urban environment said more often that they have exhausting household chores. The limited activity was explained with the lack of free time mostly as a result of great amount of studying as well as the lack of motivation to exercise. Scoliosis was present in 50% of those who said they have the disadvantage that attitude (21%). Group 29% of all respondents are under the control of the orthopedic clinic. It has been observed that the higher the education level, the less often been used in schools gymnastics.

Parents and teachers need to intensively engage in appropriate educational activities designed to motivate young people, especially girls to greater participation in active recreation.

Key words: physical activity, health promotion, youth



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The body type and body composition and size and structure of the head in young women

Introduction: It is known that the mass of the brain increases along with the increase of body mass in different species of mammals (cephalisation). The aim of this study is to establish if there is a correlation between differentiation of the size and structure of the head and the body type and body composition in young women.

Materials and methods: The examined group consisted of 51 female physiotherapy students. The mean age of the group was 22.25 years ($s=1.07$). Some of the anthropometric parameters connected to 1. the body type and composition were evaluated: body weight (kg, $x=59.23$, $s=7.57$), body height (cm, $x=163.55$, $s=6.18$), Quetelet's Index (g/cm , $x=361.87$, $s=42.12$), Livie's Index ($\sqrt[3]{kg/m}$, $x=23.81$, $s=1.01$), Rohrer's Index (g/cm^3 , $x=1.36$, $s=0.17$), Škerlj's index (cm/cm, $x=34.41$, $s=3.86$), BMI (kg/m^2 , $x=22.14$, $s=2.59$), WHR (cm/cm, $x=0.78$, $s=0.06$), global body adiposity (mm, $x=61.25$, $s=15.94$), muscularity index of upper extremity (cm/cm, $x=38.21$, $s=5.31$), muscularity index of lower extremity (cm/cm, $x=41.78$, $s=4.95$), arm total transversal area (cm^2 , $x=58.67$, $s=14.44$), arm muscular transversal area (cm^2 , $x=30.83$, $s=11.05$), arm fat transversal area (cm^2 , $x=27.84$, $s=7.48$), and the second group, connected to the size and structure of the head: head circumference (cm, $x=55.41$, $s=1.69$), width-length index of head (mm/mm,

$x=83.22$, $s=4.99$), the quotient of head circumference and body height (cm/cm, $x=0.34$, $s=0.01$), the quotient of head circumference and BMI (kg/m , $x=12.28$, $s=1.54$). Spearman's Rank Correlation Test (R, p) and Pearson Correlation Test (r, p) were used in statistical analysis.

Results: Following statistically significant correlations ($p<0.05$) were obtained: between the circumference of the head and the body mass ($r=0.2907$, $p=0.0377$), between the width-length index of head and global body adiposity ($r=-0.2775$, $p=0.0486$), between the quotient of head circumference and body height and: Livie's Index ($r=0.4350$, $p=0.0010$), Rohrer's Index ($R=0.4377$, $p=0.0013$), muscularity index of lower extremity ($R=0.4134$, $p=0.0026$, between the quotient of the head circumference and BMI, and: body mass ($r=0.8230$, $p=0.0000$), Quetelet's Index ($r=0.9391$, $p=0.0000$), Livie's index ($r=0.9096$, $p=0.0000$), muscularity index of upper extremity ($r=0.6669$, $p=0.0000$), arm fat transversal area ($r=0.4195$, $p=0.0020$).

Conclusion: In young women there is a correlation between the structure and composition of the body, and the size and structure of the head.

Key words: body type, body composition, young women, anthropometry



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The age of menarche and the body type and body composition in young women

Introduction: It is known that body types are divided into ectomorph, endomorph and mesomorph, based on the age of menarche in adolescent females. The aim of this study is to establish whether there is a correlation between the age of menarche and body type and body composition in young women.

Materials and methods: The examined group consisted of 51 female physiotherapy students. The mean age of the group was 22.25 years ($s=1.07$), while the mean age of menarche = 12.90 years ($s=0.88$). Some of the anthropometric parameters related to the body type and composition were evaluated: body weight (kg, $x=59.23$, $s=7.57$), body height (cm, $x=163.55$, $s=6.18$), Quetelet's Index (g/cm , $x=361.87$, $s=42.12$), Livie's Index ($^3\sqrt{kg/m}$, $x=23.81$, $s=1.01$), Rohrer's Index (g/cm^3 , $x=1.36$, $s=0.17$), Škerlj's index (cm/cm , $x=34.41$, $s=3.86$), BMI (kg/m^2 , $x=22.14$, $s=2.59$), WHR (cm/cm , $x=0.78$, $s=0.06$), global body adiposity (mm, $x=61.25$, $s=15.94$), muscularity index of upper extremity (cm/cm , $x=38.21$, $s=5.31$), muscularity index of lower extremity (cm/cm , $x=41.78$, $s=4.95$), arm total transversal area (cm^2 , $x=58.67$, $s=14.44$), arm muscular transversal

area (cm^2 , $x=30.83$, $s=11.05$), arm fat transversal area (cm^2 , $x=27.84$, $s=7.48$). Spearman's Rank Correlation Test was used in statistical analysis.

Results: Following statistically significant correlations ($p<0.05$) were obtained between the age of menarche and: body mass ($R=-0.2864$, $p=0.0415$), Quetelet's Index ($R=-0.3427$, $p=0.0138$), Livie's Index ($R=-0.4262$, $p=0.0018$), Rohrer's Index ($R=-0.4262$, $p=0.0018$), Škerlj's index ($R=-0.3415$, $p=0.0141$), BMI ($R=-0.4154$, $p=0.0024$), muscularity index of upper extremity ($R=-0.4040$, $p=0.0032$), muscularity index of lower extremity ($R=-0.3533$, $p=0.0109$), arm total transversal area ($R=-0.3496$, $p=0.0118$), arm muscular transversal area ($R=-0.4658$, $p=0.0005$).

Conclusion: There are some significant correlations between the age of menarche and the body type and body composition in young women.

Key words: body type, body composition, young women, anthropometry



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Enzyme activity: acetylcholinesterase and glucose-6-phosphate dehydrogenase in winter swimmers

Introduction: The aim of the study was to show changes in the activity of acetylcholinesterase (AChE) and glucose-6-phosphate dehydrogenase (G-6-PD) in winter swimmers between the end (April) and beginning of the consecutive winter swimming season (November).

Materials and methodology: The study group consisted of 16 winter swimmers (non-training males) from the Krakow "Kaloryfer" [Radiators] Winter Swimming Club, regularly undergoing submersion in cold water at a temperature of 2-7.2°C for a maximum of three minutes during the winter swimming season. The tests were carried out at the end and before the

beginning of the following winter season using the method of spectrophotometry.

Results: Analysing the average values of enzymes after (April) and before the next (November) winter bathing season, there was a decrease in the activity of AChE [U/gHb] by 18.26% and G-6-PD [U/gHb] by 22.11% in men undergoing winter baths. **Conclusions:** Regular use of winter bath treatments results in increased enzyme activity: AChE and G-6-PD; and while break in winter swimming reduces the activity of these enzymes.

Key words: enzymes, acetylcholinesterase (AChE), glucose-6-phosphate dehydrogenase (G-6-PD), winter swimming



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Contemporary theories of etiopathogenesis of idiopathic scoliosis

The reasons for the formation of lateral curvature of the spine / scoliosis have been sought since the earliest times. Until now, we have managed to get to know its pathogenesis, course and factors conducive to progression, but the reasons for its development are still not fully understood. It is now accepted that idiopathic scoliosis is a complex genetic disease (autosomal

feature, dominant, probably sex-coupled). Genetic disorders affect the functions of the sympathetic and parasympathetic system, the functions of pituitary hormones, sex hormones, leptin, somatomedins and others, which disturbs the symmetrical growth of the spine and elasticity of the spinal cord.



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Assessment of the knowledge of ergonomics in a group of employees of retail chains

Introduction: Spine pain syndromes are classified as civilization diseases which constitute a serious health, social and economic problem.

The aim of the research was to examine the level of knowledge on the principles of ergonomics and its use in a group of employees of retail chains.

Material and method of the research: The research was conducted in 2018, in a group of 85 employees employed in individual outlets of retail chains, performing mixed (physical and office) work, including 52 men and 33 women, at an average age of 34.1 (SD=6.78, Me=32 years). The division of the respondents due to their seniority: <5 years (20% of the respondents), 5-15 years (62.3% of the respondents), >15 years (17.7% of the respondents). The authors' own questionnaire, surveys, NDI and RMI questionnaires, a diagram of pain topography for the cervical and lumbar section of the spine were used in the study. The results of the research were developed statistically using the Microsoft Excel 2013 spreadsheet and IBM SPSS (p=0.05).

Results: Among the respondents, 58 people (68.2%) were suffering from spinal pain (28 men – 48.3% and 30 women – 51.7%). Based on the chi-square independence tests, no significant dependence was found between the age (p=0.301), the sex (p=0.919) and the application of the principles of work ergonomics as well as between the nature of work (p=0.279), the activity undertaken (p=0.563) and the feeling of back pain during work. No significant dependence was found between the low back pain (p=0.053), or the intensity of neck pains (p=0.026) during daily professional activities and the knowledge of ergonomics principles.

Conclusions: 1. The sex and age of office workers do not show the relationship between the spine pain and the application of the principles of work ergonomics. 2. The nature of work and knowledge of the principles of ergonomics are not related to the feeling of ailments from the spine during performing everyday professional activities at work.

Key words: ergonomics, neck pain, back pain, employees



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Assessment of the occurrence of pain in the lumbar spine among people training selected weight disciplines

Introduction: Weight disciplines trained in an amateur or competitive way carry the risk of serious injuries within the lumbar spine. The aim of the research was to assess the frequency of pain occurrence in the lumbar spine among people training selected weight disciplines.

Material and methods of the research: The research was carried out in 2017, among 50 men, randomly selected, training weightlifting, weight triathlon and bodybuilding in an amateur way (an average age 20.4 years). A research tools: the authors' own questionnaire, the RMI questionnaire, a diagram of the topography of pain for the lumbar spine. The analysis of the results was carried out with the use of the Microsoft Excel 2010 spreadsheet.

Results: The results of the research showed that among the men training weight disciplines, 20 men (40%) experienced pain in the lumbar spine, including 55% of those training bodybuilding, 50% of those training weightlifting and 30% of

those training weight triathlon. The research showed the dependence between the age of the studied and their long-standing training, the frequency and length of training sessions, the presence of the instructor during exercises, the knowledge of ergonomics and skilful conduct of training, and the occurrence of pain in the lumbar spine.

Conclusions: 1. Among people training weight disciplines, lumbar spine pain occurs most often among people training bodybuilding, and the least often among people training weight triathlon. 2. The occurrence of lumbar spine pain in the examined groups depends on the age of the studied, but it does not depend on the training experience. 3. Frequency of training sessions during the week and their duration affect the occurrence of pain in the lumbar spine to the greatest extent among people training bodybuilding, and to the smallest extent in the group of triathletes.

Key words: epidemiology, back pain, weight disciplines



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Assessment of the effectiveness of the therapy according to the method of Brian Mulligan and Robin McKenzie in the treatment of spinal headache. A systematic review

Introduction: Headaches affect people all over the world, of all ages regardless of the race or socio-economic status. People suffering from headaches complain about a reduced quality of life and limitations in interpersonal relations. The aim of the research was to present the effectiveness of selected, manual procedures used to treat spinal headaches based on an overview of current scientific literature.

Material and method of the research: The authors reviewed the literature of the years 2012-2017 in terms of all studies relating to the use of manual therapy in treatment of cervical headaches. The database review included: Medline, PubMed, PMC with the use of the key words: Mulligan, McKeznie, Headache, Cervicogenicheadache, Cervicalheadache, Tension-typeheadache, Tensionheadache.

Results. The review of the databases indicates a small number of references in the field of spinal headache therapy. Most studies are limited to summarizing previous works in this field. The re-

search showed that among people treated with Mulligan's SNAG technique, the mean assessment of headache after the therapy decreased from 46.85 mm to 19.70 mm, and the decrease in the value was statistically significant (27.15 mm at $p < 0.05$). The average daily length of headaches decreased by 3.20 hours after applying the SNAG technique. After applying MDK McKenzie therapy, the level of headache decreased from 41.7 mm to 38.3 mm. The tension of the descending trapezius muscle decreased by 6 N/m compared to the condition before the therapy.

Conclusions: 1. Manual therapy is highly effective in the treatment of spinal headaches. 2. The lack of multidimensional research makes it impossible to answer unequivocally which method of treating headache is the most effective. 3. Mulligan's 'SNAG for headache' technique shows high effectiveness in reducing pain. 4. The therapy according to the McKenzie method supports the reduction of headache symptoms of the spine origin.

Key words: Headache, Mulligan, McKenzie, systematic review



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Monitoring of physical activity in patients with cardiovascular disease

Introduction: The purpose of this survey was to objectively monitor the level of physical activity in patients with cardiovascular disease and to assess their quality of life.

Material and methods: We conducted the survey in patients treated for cardiovascular disease at the Cardiac dispensary Clinic of Sekčov in Prešov. The survey was attended by 30 respondents, 15 men and 15 women aged 44 to 65 (average 57.24 years), BMI averaged 25.8. We assessed the motion activity using the international questionnaire IPAQ short form. The quality of life was assessed using the questionnaire Quality of Life SF-36.

Results: By analyzing the questionnaire SF-36 we determined that the quality of life was the most reduced in the domains of vitality 48.32% and body pain 29.15%. By analyzing the questionnaire IPAQ we determined that 20 (66.67%) respondents

had moderate activity level, 8 (26.66%) respondents were high level of activity, and 2 (6.67%) respondents had low level of activity - inactive. The average intense physical activity was 1013.33 MET min/week, a moderate exercise activity was average 1015.33 MET min/week and walking average 1005, 95 MET min/week. The time spent sitting for respondents with a high level of physical activity was 10.3 hours per week on average, 10.58 hours per week for active subjects, 11.66 hours per week for the low active individuals.

Conclusion: In our survey, we assessed a deficit of physical activity and a correspondingly lower quality of life. Appropriate and targeted exercise activity in cardiac patients reduces many risk factors and also mortality on cardiovascular disease.

Key words: Physical activity. Cardiovascular disease. Quality of life



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Evaluation of psychomotor development of children depending on the method of care and length of breastfeeding during infancy

Introduction: The psychomotor development of the child begins in the intrauterine life and then continues throughout the: neonatal, infant, pre-school, early school and school period. The child's development is influenced by various factors, such as the way of care and the length of breastfeeding. The aim of the study is to assess the psychomotor development in children of different ages, depending on the method of care and the length of natural feeding during the infancy period.

Materials and methods: The research involved a group of 42 children (17 boys and 25 girls). The children were aged from 13 months to 9.5 years. The study consisted of two parts: a questionnaire for parents, concerning methods of childbirth, development, presence of therapy, breastfeeding, care and the parents' knowledge in this area. The second part was a study of the child's psychomotor development using tests: Munich

Functional Developmental Diagnostics, MOT 4-6, the Zuchora Index of Physical Activity.

Results: Both the knowledge about breastfeeding and the length of breastfeeding is higher when the mothers were older, with higher education and living in cities. Girls and children, who used the baby pacifier for shorter period of time and among those whose labour was natural, were being breastfed longer. Children after natural labour achieved higher scores. Psychomotor development in the first year of life is faster among girls, while boys obtained higher results in MOT 4-6 and the Zuchora Index of Physical Activity.

Conclusion: Extending the breastfeeding period of babies makes them faster to achieve „milestones”. Increasing the scope of proper infant care may positively influence the child's psychomotor development.

Key words: psychomotor development, breastfeeding, MFDR

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Physiotherapy of adolescent-age scoliosis by sm method according to Smiška

Introduction: There is no exact cause of idiopathic scoliosis, although there are many influences and factors that act to form a spinal deformity directly or by secondary form of an adaptation mechanism. Although scoliosis may not cause any problems, it presents the risk of pain as well as degenerative spinal disorders.

The aim is to state one of the ways to effectively solve these problems and to monitor whether the treatment with the SM method affects the mild scholiotic curve in adolescents at the time of growth.

Materials and methods: The basic assembly of the SM system consists of 11 exercises that most easily exercise all the important muscles and muscles of our body. The candidate will be able to work out for 10 minutes and thanks to its simplicity and timelessness it is suitable for everyday exercise. We have verified the efficacy and relevance of this elastic routine exercise system in people with idiopathic scoliosis. On the basis of examination of the locomotory system, a target movement

program based on the above method was established for two probands aged 15 and 15 years.

Results: At the observed time interval of six months, the effect of the exercise was very positive based on X-ray. image and objective measurements and examinations. The result of six months of therapy was an X-ray. reduction of the skoliotic curve by 7° according to Cobb, improvement in the sense of alignment of the skew axis and shoulder alignment. The results are described in more detail in the effects of the therapy. Objective evaluation normalized the hypotonicity of multiple muscles, restoring the length of the shortened muscles.

Conclusions: The results confirm that SM is a system of spiral stabilization and mobilization according to an effective form of primary prevention in the case of idiopathic scoliosis. This is a simple exercise that can be done under the supervision of a physiotherapist or after basic training and individually at home.

Key words: stabilization, mobilization, spine, scoliosis.



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Assessment of the impact of environmental barriers on the prevalence of disability in people over 60 years of age

Introduction: There is an increased prevalence of disability in older people with age. The emerging functional problems are the result of interactions and qualities of individuals (disabilities, limitations of activity and participation) as well as personal and environmental factors.

Materials and methods: The study covered a group of 100 people aged 65-85 living in the Podkarpackie Voivodeship. The study used a WHODAS 2.0 questionnaire implemented for assessing disability and a set of ICF categories in order to assess barriers occurring in the environment of the subjects.

Results: The results obtained by means of the WHODAS 2.0 questionnaire showed in the vast majority of respondents (45.00%), moderate disability. The average level of disability in the study group was 43.25 points. The greatest difficulties were found in the area of mobility and everyday activities. What is more, numerous barriers have been found both in the internal environment (average 7.31 barriers) and exter-

nal one (average 8.82 barriers). The most frequent obstacles in the house were steep stairs, not adapted furniture in the kitchen, too low seat bases, and in terms of the external environment, there were roads with fast moving cars, missing or remote pedestrian crossings, long distance to health centers, and long distance to a bus stop. Moreover, statistically significant influence of environmental barriers on the prevalence of general disability in the study group ($p < 0.001$) has been determined, as well as on the prevalence of disability in each of the examined domains WHODAS 2.0 have been determined.

Conclusions: There are numerous barriers in the environment of the researched elderly significantly affecting the higher level of their disability. Therefore, it is necessary to analyse the living environment of older people in Poland and to undertake actions aimed at eliminating barriers in order to improve functioning and independence of people over 60 years of age.

Key words: elderly people, disability, environment

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Isokinetic strength evaluation of the knee extensors and flexors in football players after ACL reconstruction – return to sport criteria

Introduction: Anterior cruciate ligament (ACL) plays an important role in maintaining stability of the knee and is the most frequently injured knee ligament. The aim of this study was isokinetic evaluation of the knee extensors and flexors strength in football players after ACL rupture and reconstruction and in football players after mild lower extremities injury, who returned to sport.

Materials and methods: Sixty five male football players (age 18 - 25 years old) participated in this study. The participants were divided into three groups: Group 1 (n=24; 79±8 kg; 177±5 cm) - subjects after ACL reconstruction, Group 2 (n=21; 69±6 kg; 178±6 cm) - subjects with mild lower extremities injury, Group 3 (n=20; 72±11 kg; 177±7 cm) control group without injuries. Biodex System 4 (Biodex Medical Systems, Shirley, New York, USA) was used in this study for the purpose of the knee extensors and flexors concentric strength evaluation, at each of the 3 angular velocities: 60°/s, 180°/s and 300°/s. The following variables were analysed: peak torque, total work,

average power and hamstrings to quadriceps peak torque ratio (H/Q ratio).

Results: Football players in Group 1 in injured leg had significantly lower values of peak torque for both quadriceps and hamstrings at all three angular velocities in comparison to Group 2 and to Group 3. Moreover subjects in Group 1 demonstrated significantly lower values of hamstring muscles total work and average power at 180 °/s and 300 °/s in comparison to Group 2 and Group 3. There were no such a significant differences between Groups 2 and 3.

Conclusions: 1. The isokinetic testing protocol with three angular velocities (60/180/300 °/s) may be useful method for the assessment of quadriceps and hamstrings muscles strength deficits in the group of football players after ACL reconstruction. 2. This isokinetic protocol should be used as a part of complex “return to sport” (RTS) testing in football players who recovered from ACL reconstruction.

Key words: isokinetic, ACL, football, RTS



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Functional diagnostics – Manual therapy – Clinical inference

In 2004 Underwood wrote that musculoskeletal dysfunctions are not only a problem of the spine, headaches, limbs etc. It is also a problem of the dysfunction in internal organs that cause symptoms resembling diseases of these organs. In objective medical research, there are no organic causes determined, despite the persistence of symptoms. The causes of functional disorders have a civilizational nature. There are many examples ie: lifestyle, decrease of the movement, occupation, injuries and diseases diagnosed in the past, congenital or acquired structural changes, type of activity (or lack) of non-professional activity, etc. Most of dysfunctions are caused by stress. Therefore, according to the research, «60% - 90% of visits to the doctor are associated with stress-induced complaints» (Newsweek 42/2004).

H. Benson stated that medicine is increasingly effective in the treatment of organic, structural and life-saving diseases. However, it does not routinely treat functional disorders, or about 80% of cases. We can listen very often: «this is not

deadly disease», «this disease doesn't exist». - Yes, you do not die but you can not live either! Diseases which have a source in dysfunctions, mainly dysfunctions of the musculoskeletal system, are treated symptomatically and their origin is mistakenly considered as an unknown. For this reason, «Learning about the connection between mental states with health and the ability to consciously move around them - this is the most important challenge of contemporary medicine» (Newsweek 42/2004 /).

With the development of physiotherapy, the awareness of the plurality of the connections, functional and structural interdependencies existing in the human body is still increasing. Places strongly involved in the formation of overall disorders are temporomandibular joints with surrounding muscles. The patient in the center of attention - Using the clinical practice model in which the Patient is the most important and provides the best possible physiotherapeutic care to every patient is the corporate responsibility both of the patient and therapist.



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Pulmonary Rehabilitation and Climatotherapy in Patients with COPD and Chronic Bronchitis

Background: The research was carried out in three health resorts in a mountain environment of the High Tatras, which form a part of the Carpathian Mountains. We aimed to test the effectiveness of the pulmonary rehabilitation in a mountain environment on the pulmonary function, physical performance, breathlessness, affective factors (anxiety, depression) and quality of life in patients with Chronic Obstructive Pulmonary Disease COPD and Chronic Bronchitis (CB).

Methods: 128 consecutive patients underwent comprehensive pulmonary rehabilitation with duration of 3 weeks in one of 3 mountain health resorts in the High Tatras. The examination included spirometry (FEV1 and FEV1/FVC), 6-minute walk test (6MWT), Borg scale of dyspnoea, and assessment

of depression (Zung score), anxiety (Beck score) and QoL using the SF-36 scales.

Results: After the intervention patients demonstrated significant improvements in objective measurements. Similarly in subjective measurements significant effect was achieved (for the Beck score, for the Zung score and QoL SF-36).

Conclusion: The rehabilitation in a mountain environment has proven to be effective. Improvements in both functional and subjective indicators were observed. These findings support the use this treatment modality.

Key words: climatotherapy-rehabilitation, COPD, chronic bronchitis, exercise capacity, quality of life.



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Monitoring of the impact of selected factors on the quality of foot arch in younger school aged children

Introduction: The purpose of the survey was to evaluate the quality of the leg arches in children of younger school age and the influence of selected factors on its quality.

Materials and methods: The survey was carried out at the Siberian Primary School in Prešov in the framework of the grant project KEGA no. 044PU-4/2016 "Innovation of medically oriented educational resources for future teachers of physical education and sports and professionals for sports and health". 34 children were examined, 22 of them were girls and 12 were boys. The mean age of children was 9.7 years ($SD \pm 0.2$) and an average BMI $20.3 \text{ kg} / \text{m}^2$ ($SD \pm 5.15$).

In the survey, basic physical parameters were assessed by anthropometric methods and the quality of the foot arch was. The non-standardized questionnaire analyzed the influence of the selected factors on the occurrence of changes in the quality of the foot arch. The quality of the foot arch was diagnosed by the Podoscope. Plantograms were evaluated by the Stritzer-Godunov index method.

Results: The most common deviation was the pes excavatus - high foot, up to 50% of children on the right foot and 38.24% of children on the left foot. By evaluating the non-standardized questionnaire, we found that out of a total of 34 wearing 21 orthopedic shoes / inserts. Of this, only 33.3% have it prescribed by the ortopedic, 66.6% of children wear orthopedic shoes / inserts on the initiative of their parents, without proper orthopedic prescription.

Conclusion: The results of the survey show a high incidence of pes excavatus and a high percentage of wearing orthopedic footwear and correctional orthopedic inserts without orthopedic prescription. We suppose that the above-mentioned changes in the quality of the foot arch could be related to the use of foot arch correction in this sample without proper orthopedic examination and prescription.

Key words: Foot arch. Pes excavatus. Orthopedic footwear. Children.



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Physiotherapy without a queue for patients with a significant degree of disability

The work presents the report of the first reporting and settlement quarter on the benefits of medical rehabilitation based on the Act of May 09, 2018 about special solutions supporting people with severe disabilities. The report is a comparative comparison of the unit having a contract for outpatient

physiotherapy, home physiotherapy and general system rehabilitation in the day ward and the global list of service providers from the Łódź voivodship with a contract with the National Health Fund.



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Reproducibility of digital inclinometer measurement of anterior - posterior curvature of the spine depending on the experimenter's experience

Introduction: Postural defects are a frequently occurring problem resulting, among other things, from lifestyle. One of the ways to detect them is by an inclinometer. It is therefore important to determine its measurement effectiveness. Aim of the study was assessment the repeatability of spine curvature measurements in the sagittal plane depending on the experimenter's experience.

Materials and methods: For the analysis, a total of 450 measurements were performed in 50 people aged 21-32. The Saunders digital inclinometer was used to assess the parameters of spine curvatures in the sagittal plane. Each person was examined by three different examiners with varying degrees of experience, and each monk performed three times. The measurements were secreted between the investigators and carried out with a minimum time interval.

The W Shapiro-Wilk test and Anova Kruskal-Wallis test were used for statistical analysis.

Results: The measurements were confirmed between the investigators in the following parameters: thoracic - lumbar transaxial (TH / L), middle thoracic (TH3), thoracic kyphosis (KKP1). The results of the measurement of the upper thoracic segment (C7), the angle of lumbar lordosis (KLL), the angle of the central thorax kyphosis (KKP2), the slope of the sacral bone (S1 and S2), differ significantly between the investigators. All parameters do not differ significantly in the 3 measurements made by the same researcher.

Conclusions: Evaluation of thoracic kyphosis parameters is consistent regardless of the researcher. The value of the measurement of cervical and lumbar lordosis depends on the experimenter's experience. The digital inclinometer examination is reproducible in studies performed by the same person.

Key words: Saunders digital inclinometer, repeatability, curvature of the spine.



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Repeatability of the assessment of the shape of the spine in the arrow plane depending on the time of examination

Introduction: Physiological curvatures play an important role in the support function of the spine, the presence of which greatly improves its endurance. Many measurement methods, both objective and subjective, are used to assess the curvature of the anterior and posterior plane. The aim of the study is to check the changes in spinal curvature depending on whether the examination is performed in the morning or in the evening.

Materials and methods: 240 measurements were analyzed in the study of 40 healthy people, whose average age is 22,03 +/- 1,16 studying Physiotherapy and Pedagogy at the University of Rzeszów in the first and second year of master's studies. The curvature test was performed with an inclinometer on a smartphone through the GoniometrPro application. All measurements were carried out by one researcher in order to avoid differences in the way they were carried out. Each participant was measured twice a day - in the morning and in

the evening, one day a week for three consecutive weeks. For statistical analysis was used the Fiderman test and Dun test

Results: Was observed an increase of parameters: slope of the sacrum, angle of thoracic kyphosis and first thoracic vertebra. Parameters that have reduced: thoracic and lumbar passage, third thoracic vertebra, seventh cervical vertebra and lumbar kyphosis angle.

Conclusions: The results show that there are no significant changes in the curvatures of the spine depending on the day of measurement, but there is a significant correlation between morning and evening measurement. The most significant differences were found in the lumbar lordosis angle, which decreased, while the angle of thoracic kyphosis increased significantly. The results show that daily activities have an effect on the size of the curvature of the spine.

Key words: inclinometer, time of day, curvature of the spine



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Evaluation of sensory perception in children from third grade music classes

Introduction: In early childhood, thanks to observation, you may often notice disorders in the process of integration of sensory stimuli. The main purpose of this work is to determine if there are differences in sensory integration between third grade children from school with a musical profile and third grade children from school with a general profile.

Materials and methods: The study involved 40 third-grade children who were divided into two study groups (n = 20) from the musical class and a control group (n = 20) from the general class. As a research tool for the assessment of sensory perception in children, the Southern Californian Sensory In-

tegration Test (SCSIT) according to Ayres was used.

Results: The average results of both groups of studied levels of sensory perception are within the norm, while children from the musical group obtained higher average results. According to SCSIT results, 7% of children from the musical group and 19% of children from the non-musical group had sensory integration disorders.

Conclusion: The participation of children in music activities facilitates the formation of new neural connections in the brain, which affect the better perception of the senses.

Key words: sensory perception, children, music classes



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Problems of psychomotor hyperactivity in school-age children on the example of the Łańcut powiat

Introduction: The aim of the work was to present related issues with the occurrence of attention deficit hyperactivity disorder and related issues with the functioning of families bringing up children who have been diagnosed with this type of disorder.

Materials and methods: The study covered 100 families of children with diagnosed psychomotor disorders (31 girls and 69 boys) in school age living in the Łańcut district. The research tool was the author's questionnaire consisting of 25 closed and open questions, created on the basis of available literature.

Results: Analyzes of research results proved that psychomotor disorders in children are diagnosed most often in the age of 9, in the group of boys in which it is found statically more often and girls. 67% of the surveyed families declared that they function differently in relation to the families of children without

diagnosed disorders - they are affected by behavior from all three diagnosed spheres: attention deficit disorder, hyperactivity and impulsiveness. 74% of families said that care / raising a child with this type of disorder is much more time-consuming than the typically developing siblings / children. 77% of families signaled the necessity of institutionalized and specialist help. Among the respondents, 67% think that there has been a significant improvement in the child's functioning after obtaining the help of specialists.

Conclusions: In connection with the occurrence of anxiety and fears related to the diagnosis, concern for the future and fear of social exclusion, these families should be covered from the very beginning with, in particular, broadly understood psychological support.

Keywords: ADHD, ADD, therapy.



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Impact of birth weight and length on primary hypertension in children

Introduction: A child's birth parameters not only enable assessment of intrauterine growth but are also very helpful in identifying children at risk of developmental defects or diseases occurring in adulthood. The birth weight of infants seems to be a strong predictor of neonatal health outcomes, such as survival chances, the risk of medical complications and the time to reach subsequent stages of development.

Purpose was to assess the impact of birth weight and length on hypertension occurring in children aged 3–15 years.

Materials and methods: 1,000 children attending randomly selected primary schools and kindergartens were examined. Ultimately, the analyses took into account $n = 747$ children aged 4–15, 52.6% boys and 47.4% girls. The children's body height and weight were measured; their blood pressure was examined using oscillometric method. Information on perinatal measures (birth weight/length) was retrieved from the children's personal health records.

Results: Compared to the SGA children, the children with appropriate for gestational age birth weight (AGA) (OR 1.31; 95% CI 0.64–2.65) present greater risk for primary hypertension. Infants born with excessive body weight > 4000 irrespective of gestational age, compared to infants born with normal body weight, show increased risk of primary hypertension (OR 1.19; 95% CI 0.68–2.06). Higher risk of hypertension is observed in infants born with greater body length (OR 1.03; 95% CI 0.97–1.08).

Conclusions:

1. The children with AGA present greater risk for primary hypertension, compared to the SGA children.
2. Birth length can be a potential risk factor for hypertension in children and adolescents.

Key words: birth weight, birth length, blood pressure, hypertension.

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The assessment of psychometric properties of the quality of life in the adolescents aged 13-18 with cerebral palsy questionnaire (CP QOL-Teen)

Aim: The aim of the study was assessment of validity and reliability of the CP QOL-Teen.

Materials and methods: 84 adolescents with CP aged 13-18 and 81 parents were enrolled in the study. The group of teenagers consisted of 37 girls (44.05%) and 47 boys (55.95%). The mean age was 15.11 (SD-1.63). GMFCS level I had 28 subjects (33.33%), GMFCS II - 26 subjects (30.95%), GMFCS III - 11 subjects (13.10%), GMFCS IV - 16 subjects (19.05%), GMFCS V - 3 subjects (3.57%) respectively. The premature babies constituted up to 60% of the group of adolescents. The group of parents consisted of 81 people, women dominated - 72 (88.89%) and 9 men (11.11%).

The psychometric properties of the Polish version of the CP QOL-Teen questionnaire were verified in adolescent and parent versions by assessment of validity and reliability.

Results: The Cronbach's alpha (internal coherence) for individual subscales was from 0.858-0.953 in the analysis of teen-

agers' results and from 0.824-0.937 in the analysis of parents' results. The interclass correlation coefficient (ICC) used to assess temporal coherence was for individual subscales from 0.82 to 0.889 in the analysis of teenagers' results and from 0.702 to 0.798 in the analysis of parents' results. The validity of the questionnaire was evaluated using the Spearman correlation coefficient between the results of the CP QOL-Teen questionnaire for teenagers and the results of the generic questionnaire KIDSCREEN-27. All CP QOL-Teen subscales of the teenager's version correlated moderately between 0.5-0.6 with all KIDSCREEN-27 subscales. Majority of CP QOL-Teen subscales of the parent's version correlated moderately between 0.4-0.6 with all KIDSCREEN-27 subscales.

Conclusion: The Polish version of the CP QOL-Teen questionnaire is a valid and reliable research tool for the assessment of the quality of life in teenagers with CP.

Key words: quality of life, cerebral palsy, validity, reliability



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Assessment of the correlation between strength and efficiency of the upper limb and the independence of older people using a wheelchair in social welfare homes

Introduction: Due to the body ageing process, the efficiency of upper limbs diminishes, which results in deteriorating of self-care in everyday life and decreasing self-reliance of the senior. The aim of the study was to assess the correlation between the efficiency and strength of upper limbs and the independence of seniors using wheelchairs in social care homes

Materials and methods: The study included 150 elderly people between 65-85 years old, using wheelchairs, living in DPS in Rzeszów and its surroundings. The criteria of inclusion of the participants in the study were: the age of 65 to 85 years, the lack of medium and severe dementia, the use of a wheelchair to move outside the room in dps. Exclusion criteria: non-stabilized internal diseases, paresis and/or pain disabling active movements. A questionnaire was used to assess sociodemographic data. The remaining scales and tools used to conduct

the study were: the scale of assessment of basic everyday activities (ADL), Barthel Index (IB), manual dynamometer, Box and Block test, Back Scratch and Arm Curl.

Results: The results of the study show statistically significant correlation between strength, agility and elasticity of the upper limb and a self-reliance in activities of daily living of elder people. Moreover, a relation between the cognitive state and strength and agility of the upper limb has been observed.

Conclusions: Strength and efficiency of upper limbs affect the independence of older people. The strength of the hand grip and the agility of the upper limbs may be considered as an important indicator of functional disability of elderly people using wheelchairs.

Key words: elderly, nursing home, wheelchairs, physical activities



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Physical activity of physiotherapists and their professional fitness

Introduction: Physical fitness is an integral part of everyone's life. It plays a special role in the physiotherapist's profession. The aim of this work is to determine the impact of physical activity on the current physical fitness and efficiency of physiotherapists.

Materials and methods: 75 physiotherapists, 54 women and 21 men aged 23-26 underwent research. The author's questionnaire, Zuchory efficiency index and Step Test were used for the study.

Results: The research shows that high physical fitness does

not depend on the physical activity of physiotherapists, but high physical fitness affects the greater physical efficiency. It is assumed that professional activity raises the physical fitness of physiotherapists.

Conclusions: Physical fitness plays a very important role in the work of a physiotherapist, its high level is not always associated with physical activity, but professional activity helps to keep it at a good level.

Key words: physical activity, physiotherapist, physical fitness, health



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Comprehensive therapy in the treatment of lymphedema in women after mastectomy

Introduction: Breast cancer is one of the most dangerous malignancies tumor, and the incidence of this disease is still growing. As a result of treatment and related removal or impairment of lymph node structure, a frequent complication is lymphoedema. There are many methods of treatment, however, the most recommended and currently the most effective is a complex decongestive therapy.

Purpose of this study: The aim of the study was to evaluate the effectiveness of complex decongestive therapy, its influence on the reduction of lymphoedema and the improvement of mobility and strength of the upper limb.

Materials and methods: The study was conducted on a group of 60 women after unilateral mastectomy at the Świętokrzyski Oncology Center in Kielce. The examined patients were divided into two groups: research and control. In the study group consisting of 30 women, KFTU treatments were performed, while other rehabilitation procedures were performed. The

therapeutic cycle lasted 10 days. At the beginning and at the end of the treatment, the change in pain severity was assessed on the VAS scale and the range of motion was measured using the goniometric method, the limb circumferences were measured with a centimeter tape and SUR was measured using a dynamometer.

Results: In both groups, after the end of the therapy, all parameters were improved, but in the research group where a complex decongestive therapy was used, the effect was more noticeable. In the study group there was a significant decrease in pain sensation, decreased limb circumference and visible improvement in strength and range of motion.

Conclusions: The use of both methods of treatment brings effects in the form of reduction of lymphatic edema, however, a complex decongestive therapy is a more effective method of treatment.

Key words: mastectomy, lymphedema, breast cancer, therapy



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Evaluation of the effectiveness of kinesiotherapy and physiotherapy for patients suffering from cervical spine pains

Introduction: Pain syndromes of the cervical spine are one of the most common causes of reduced functioning in social and professional life. The cause of pain is most often the overload, resulting from the anatomy and biomechanics of this spine segment. Comprehensive physiotherapy plays an important role in relieving pain: early rehabilitation, individually tailored to each patient, prophylactic treatment, as well as the patient's lifestyle.

The aim of the study was to assess the effectiveness of physiotherapeutic treatments in reducing pain in the cervical spine and to check how the rehabilitation program affected the mobility of the cervical spine.

Materials and methods: The research was based on self-writ-

ten questionnaires, in which patients made a subjective assessment of pain with the VAS (Visual Analog Scale) and modified Laitinen scale. Measurements of the scope of mobility of the cervical spine were made with using a centimeter tape. These tests were carried out twice before and after the rehabilitation period.

Conclusions: The physiotherapy program included in the study had a statistically significant effect on the reduction of pain, increased range of mobility of the cervical spine, as well as on the subjective improvement of the patients' physical fitness.

Key words: pain, cervical spine, VAS



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The quality of spa treatment and its side effects in the subjective assessment of patients with osteoarthritis

Introduction: Balneotherapy used in sanatorium conditions is a popular treatment for people with osteoarthritis. Polish sanatoriums offer a wide range of treatment and rehabilitation using a variety of balneotherapeutic factors. Aims of the study: Assessment of the quality of functioning of natural medicine centers and social conditions in spas in Subcarpathian region in the subjective opinion of patients. Evaluation of the incidence of side effects of spa treatment.

Materials and methods: Initially 98 people with osteoarthritis were qualified to participate in the survey. All people used at least three weeks of spa treatment in Subcarpathian region (Horyniec Zdrój, Iwonicz Zdrój, Rymanów Zdrój, and Polańczyk Zdrój). After agreeing to participate in the study, patients filled out a questionnaire containing questions about, among other things, quality of accommodation, quality of food, quality of the physiotherapy department, type of balneotherapy, kinesiotherapy, massage and physical therapy and side effects of the therapy. 93 people (59 women and 34 men)

gave complete answers to the questionnaire. The average age of the respondents was 67 years.

Results: 43 respondents rated the accommodation as very good. 53 respondents rated the quality of food as very good. 51 respondents rated the functioning of the physiotherapy department as very good. All respondents reported that the treatment implemented in the spa included balneotherapy and kinesiotherapy as well as selected elements of physical therapy or massage. 6 people reported that they had side effects of sanatorium treatment.

Conclusions: 1. In the subjective assessment of patients, the physiotherapy departments in the health resorts of Subcarpathian region operate at a high level and the accommodation and catering conditions in health resorts are satisfying. 2. In some cases, sanatorium treatment may cause side effects in the form of temporary headaches, pressure fluctuations and worsening of the symptoms of osteoarthritis.

Key words: Spa treatment, balneotherapy, osteoarthritis



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Virtual reality and prevention of falls of elderly people

The Central Statistical Office estimates that in the perspective of the next fifteen years, almost every fourth resident of our country will exceed the contractual age threshold, supplying 8.5 million population of older Polish people. Such a rapid growth of the oldest population group is now and will be a challenge for many fields of science in the future.

The aging of society is closely related to the emergence so-called „big geriatric problems”. We can include here falls, as one of the most serious causes loss of fitness by older people. Therefore, the development of modern technologies that it sets new trends in prevention, treatment and also allows for taking various forms of physical activity creates the possibility of using virtual reality to prevent falls. Virtual reality is more often used in the prevention and treatment of people with different dysfunctions and in all ages.

Relatively simple operation and a relatively low cost allow you

to use this type of equipment regardless of age, and the variety of programs and games creates the opportunity to diversify preventive actions and the rehabilitation process through introduction of alternative forms of activity, and also prevent against „digital exclusion”.

Modern support technologies cover the whole spectrum of products that differ from each other in terms of both technical sophistication and complexity, but allow for taking on more and more challenges, creating conditions for overcoming further barriers even by older people.

Analysis of available literature and own experience show that the largest application in the prevention of falls they have virtual reality products they use mostly older people operating independently. Term virtual reality does not mean that they are only new electronic solutions, but also facilitating devices reeducation of motor patterns in older people.