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XII INTERNATIONAL DAYS OF REHABILITATION

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Muscular Dysbalance in Working Nurses

Introduction: Health care professionals is increasingly experiencing overloading of spine sections due to poor movement habits in handling the patient. Correct movement stereotypes are important in the exercise of the health care profession, because they serve to prevent muscle imbalance, which results in pain in overloaded spine.

Material and Methods: The subject of our survey was the 160 nurses who work in the hospital's inpatient department. Nurses have never been treated for vertebrogenic diseases. As part of physiotherapy, we have used assessment of weakened and shortened muscles of the Janda approach. We divided the muscle imbalance into the Upper crossed syndrome and Lower crossed syndrome. We influenced them for 3 months in the form of kinesiotherapy- autotherapy of postisometric re-

laxation, automobilization of spine part, reciprocal inhibition and elements of the Back School in the course of their work.

Results: Based on the statistical evaluation of muscle imbalance, nurses have released shortened muscles and strengthening weakened muscles. After the indicated physiotherapy, there was a reduced number of nurses with muscle imbalance in both crossed syndromes.

Conclusions: Education about correct movement habits is necessary for health care professionals not only for pre-existing back pain, but also for prevention of their occurrence. It is necessary to adhere to the elements of the Back School while handling the patient.

Key words: Back School. Janda approach. Kinesiotherapy. Physiotherapy.



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The effect of potassium iodide iontophoresis on the thyroid hormone levels in healthy people

Introduction: Evaluation of short and long-time effects of iontophoresis with 2% potassium iodide on the thyroid area.

Material and methods: The study included 50 healthy volunteers divided into 2 groups: 1) subjected to cathodic galvanization on the thyroid area (25 people); 2) iontophoresis with 2% potassium iodide for the thyroid area (25 people). The subjects were tested for TSH, FT3 and FT4 before the series of treatments (test 1), immediately after the series of treatments (test 2), and after approx. 6 months (test 3). 36 subjects took part in last follow-up (test 3). Changes in these parameters were analyzed in individual groups. The effect of therapy was also compared between the groups subjected to galvanization and iontophoresis.

Results: Immediately after galvanization, TSH decreased in 60% of the subjects, and after iontophoresis in 72%. The chang-

es were not statistically significant in any of the groups. A similar level of effects of the performed procedures was noted for the other two parameters, and there were no statistically significant differences between the examined groups. A significant decrease in the determined indicators was noted in the period between tests 1 and 3 in the galvanization and iontophoresis group.

Conclusions: 1. Electrotherapy treatments performed in the neck area may affect the function of a healthy thyroid, regardless of the presence of the drug substance. It is reasonable to conduct a study involving a larger group to confirm the safety of treatments.

Key words: potassium iodide iontophoresis, galvanization, thyroid hormones



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The impact of physical therapy programs on reducing pain in patients after breast reconstruction

Abstract: Breast cancer is the disease of greatest concern among women worldwide. Improving surgical techniques, treatment increases the survival and recovery time of these patients. Since surgery is the first choice to treat breast tumors, reconstructive surgery has become an important procedure that helps to recover the injury after radical or conservative breast surgery.

A program of physical rehabilitation was developed, the basis of which is the influence on the physical and functional state of a woman after breast reconstruction.

Pain - a fairly common complication that can occur at different times after surgery, can cause disability, limiting the amplitude of movement and muscle strength. Analyzing the results of pain localization in 100% of patients, pain was evident in the wound area and under the armpits. There were also complaints of pain in the shoulder, scapula and chest, as well as the inner and outer surfaces of the upper extremity on the operated side. After completing the course of physical therapy, all indicators decreased significantly.

Repeated analysis of the intensity of pain in the resting state

was performed on a visual-analogue scale and a scale of verbal assessments.

The intensity of pain on the scale of verbal scores decreased from 2.95 points to 0.65 points and is characterized, mainly, as a slight pain or no pain at all.

The results of the evaluation of pain intensity with a visual-analogue scale revealed significant changes in the final indices ($p < 0.05$). Thus, in patients, the median indicator decreased by 5.30 points, which confirms the positive impact of the program developed on the reduction of pain intensity in post-operative patients.

Analyzing the nature of the pain after physical therapy, we found that patients experienced pain similar to discomfort or only manifested when someone touched the operated area. In isolated cases, the pain throbbed and squeezed. These results suggest that a well-designed physical rehabilitation program for women with individual selection was a good target for pain relief.

Key words: pain, reconstruction, breasts, physical therapy.



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Psychomotor development of children with neurodevelopmental disorders in the aspect of impact of risk factors – preliminary report

Aim of the study: The aim of the study was to assess the psychomotor development of children with neurodevelopmental disorders in the aspect of impact of risk factors.

Material and methods: The study group (GB) consisted of 104 infants with neurodevelopmental disorders (risk children), improved in the physiotherapy workshop and in the rehabilitation day ward, the control group consisted of 50 healthy children. Information on risk factors was collected from pregnancy and perinatal history and medical records. Psychomotor development was studied by the Munich Functional Developmental Diagnosis (MFDD) tests before therapy, at 12 months, 18 months and 26 months in subgroups according to the classification of central nervous coordination disorders (CCD1-4) and taking into account the duration of pregnancy (CTC) in three subgroups: children born on time, premature babies later born (34-37Hbd) and premature babies prematurely born (below 34Hbd).

Results and conclusions: The results of statistical analyzes showed that, in total, there were on average (4.42 ± 2.56) risk factors per child in the GB group, in CG (0.78 ± 0.92). In CCD4-3 (6.63 ± 2.81 ; 5.10 ± 1.96 , respectively), in the subgroups of premature babies born earlier and later (7.33 ± 2.35 and 4.85 ± 2.40 , respectively), in reported 3.36 ± 1.9 . Significantly greater impact of risk factors on psychomotor development was noted in study I (before therapy) and II ($p < 0.001$; $p < 0.01$), weaker relationships in study III and IV ($p < 0.01$; $p < 0.05$). Among the pathological factors, the following were important: threatening asphyxia, delivery process, respiratory complications, CNS bleeding and others, but the most important risk factor was shortening the duration of pregnancy.
Key words: neurodevelopmental disorders, risk factors, psychomotor development



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Social and living conditions of families of children at risk – preliminary report

Aim of the study: The aim of the study was to assess the social and living conditions of families of children at risk in comparison to the control group and in subgroups according to the classification of disorders of central nervous coordination (CCD1-4) and taking into account the duration of pregnancy (CTC)

Material and methods: The study group (GB) consisted of 104 infants with neurodevelopmental disorders (risk children), improved in the physiotherapy laboratory and in the rehabilitation day ward, the control group consisted of 50 healthy children. Information on the social and living situation according to the Questionnaire. The study was collected from pregnancy and perinatal history and medical records.

Results and conclusions: The characteristics of the families of the examined children and the analysis of the social and

living situation showed significantly worse education of fathers and housing conditions in comparison with GB and CG. Over 1/3 of fathers from GB had basic and vocational education (36%), three times less in the Capital Group. Very good housing conditions were declared by 70% of families from the Capital Group and slightly more than half in GB (53%), what is more, 17% of risk children lived in families of more than 6 people, including 15% of whom had sufficient and insufficient housing conditions. The results were similar in the CCD subgroups, which varied in terms of place of residence and material status of the family, while in the CTC subgroups it was shown that the most preterm births (below 34 Hbd) were recorded in professionally active mothers with higher education.
Key words: social and living conditions, risk children, family structure



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Assessment of influence cognitive task on the balance with use the sensory organisation test

Introduction: Balance is defined as the state of the postural system, which is characterized by a vertical orientation of the body maintained by balancing the forces acting on the body and their moments. Balance control is a complex process in which the system of deep sensation, labyrinth, vision system and foot mechanoreceptors provide information about the position of the body in space, and the proper integration of stimuli by the nervous system ensures an adequate motor response. This dynamic process of neuromuscular coordination allows for undertaking varied motor activity. The aim of this study was the assessment of the impact of cognitive tasks on balance parameters using the sensory organization test.

Material and methods: The research material was a group of physiotherapy students aged 20-23. The study was carried out using Smart Balance Master (NeuroCom). Sensory organization test (SOT) allows to assess the balance in six tests

in conditions of sensory conflicts. The tests were carried out twice, at the same time every week. During the first study, balance parameters were assessed using a sensory organization test, during the second study one of the researchers read general knowledge questions that required additional involvement from the subject. The balance (Equilibrium Score) and the overall score (Composite) were calculated for each of the six trials.

Results: No statistically significant differences between the first test and the second test were found, where, during the sensory organization test, the subjects answered general knowledge questions.

Conclusions: In the studied age group, the additional cognitive task proposed by the researches didn't result in changes in the parameters of the sensory organization test.

Key words: balance, cognitive tasks, sensory organization test



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Vojta method of the 2nd Generation as the means for correcting wrong body posture of preschool children

Introduction: Untreated disorders of body posture, which emerged in childhood, can result in deep and painful functional disorders of the musculoskeletal system, while in adult age. The aim of our work was to find out to what extent can three months of exercising Vojta's method of the 2nd Generation (VM2G) improve the body posture. The VM2G method is based on principles of reflex locomotion.

Material and methods: Our case report consists of a girl named E.G., who is 4 years old. The investigation consisted of an input measurement, that included a two-weight posture test and posture measurement using the mobile app Posture screen. The main function of this application is analysis, comparison and evaluation of body posture. The app works with the help of the camera and creates calculations, thanks to the square matrix, on which, it can project the person photographed. In addition, it measures angles, linear distances between postural shifts, and based on these measurements, it produces documentation, comparative reports and assessments, so it creates a broader picture of the patient's health and posture. The initial examination was followed by education of the legal representatives (parents), who regularly trained VM2G with E.G. for 6 months, 6 times a week for 10 minutes. During the exercise, the child must be as relaxed as possible and at the same time his/her attention will be distracted. Watching animated cartoons or listening to children audiobooks has proven to be the best way to distract the child. While the child watches or listens to the audiobook, the parent stimulates its reflex zones on which the foam balls are placed. Foam balls serve primarily to ease the discomfort caused by direct pressure of thumbs, they also serve for better labilization of a precise exercise position and stimulate as many reflex zones as possible. Control and adjustment of VM2G

exercise was performed every month, whilst the child E.G. (along with her parent) visited a physiotherapist, who led the whole therapy. The physiotherapist supervised the exercise of parent and adjusted the exercise every month to intensify it. After three months, the examination was repeated the same way as before, so that the data could be compared.

Results: The two-scale test proved, that while in the initial testing, the load was measured at 5 kg for right leg and 7 kg for left leg, the final testing showed us the load to be slightly more even – 6.5 kg on the right leg and 6 kg on left leg. It is noted, that during those three months, the child gained 0.5 kg of weight. The results obtained through Posture Screen also clearly showed an improvement in almost every measured section. The totals of results of the measured deviations, in terms of displacements and deviations from the norm were: the first measurement, front side – 3,35 cm and 8,2° and the second measurement showed us 0,38 cm and 1,4°. The back was first measured deviated by shift 4,05 cm and tilt 50,6°, whilst the second measurement proved shift to be lower – 3,94 cm and tilt to be 20,4°. On the right side, the shift in the beginning was 7,27 cm and tilt 26,9°, the second measurement showed improvement – shift by 4,27 cm and tilt by 15,24°. and finally the left side of body posture improved from initial 7,33 cm shift and 36,4° tilt to final 5,12 cm and 20,1°.

Conclusion: Based on the results we can see that the posture has improved. The Vojta method of the 2nd generation can thus be considered a suitable means of correcting the wrong posture. It is also true, that the posture has not been fully corrected just during these 3 months of exercise. It is therefore necessary to continue the exercising further.

Key words: Body posture. Wrong body posture. The Vojta method of the 2nd generation.



Burkiewicz Arseniusz

Visceral therapy – how to work safely?

The visceral system is the internal organs and the connective tissue structures surrounding them, as well as the accompanying blood and nerve supply. Originally, it was called the central system. The workshop aims to familiarize us with this sensitive structure while maintaining safe work. Understanding what is

the visceral skeleton, how the organs move, where the sliding surfaces are, what are the support structures and visceral joint connections. We will learn reference points, safety tests and how the enteric and autonomic nervous system controls it.



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Assessment of reproducibility and reliability of HEG biofeedback device

Introduction: A review of literature shows that no studies have yet assessed reliability of HEG BF devices. The only currently available reports suggest that this is a promising technique which can be applied in treatment of cognitive impairments, depression as well as attention and concentration deficits. The study was designed to examine inter-rater reliability in a test-retest assessment of an HEG BF device, performed by two examiners.

Material and Methods: The study involved 30 healthy volunteers, including 15 females and 15 males, aged 20-23 years. The exams were conducted by two examiners, one with experience and one trained in operation of HEG BF device. HEG BF device reliability assessments were performed by a third-year student of physiotherapy and an experienced researcher.

Results: The findings show inter-rater agreement of the measurements, reflected by the results of Spearman's Rank correlation coefficients identified for all the parameters taken into account, i.e. HEG Ratio Mean ($R=0.86$; $P<0.001$), HEG Ratio Max ($R=0.85$; $P<0.001$), HEG Ratio Min ($R=0.87$; $P<0.001$) and a lack of statistically significant differences in Mann-Whitney U test

Conclusions: High inter-rater agreement was shown in a test-retest assessment of HEG BF device, performed by two examiners. Further research is needed to investigate intra-rater agreement of the HEG BF device.

Key words: biofeedback, HEG, inter-rater reliability, concentration



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Assessment of a rehabilitation program effectiveness and durability of its outcomes related to gait recovery and activity of the frontal cortex following stroke – a case study

Introduction: The purpose of the study was to assess effectiveness of a rehabilitation program and durability of its outcomes in gait and balance, as well as changes in the activity of frontal cortex, in a patient with hemiparesis at a chronic stage of recovery post-stroke.

Material and methods: The study focused on a case of a 56-year-old female patient with right-sided hemiparesis after a stroke. HEG BF was applied to measure blood flow in the frontal lobe. The patient's walking speed, gait efficiency, and dynamic balance were assessed using the clinical tools: Timed Up and Go Test, Two Minute Walk Test, and 10 Metre Walk Test. The examinations were carried out three times: upon admission to the Ward (Exam 1), at the end of the rehabilitation program (Exam 2), and at a follow-up two weeks after the patient was discharged from hospital (Exam 3).

Results: The timing measured in Up and Go Test in Exam 1 amounted to 9.58 s, in Exam 2 the value decreased to 7.62 s, and in Exam 3 is increased to 8.90s. The walking speed com-

puted in 10 Metre Walk Test in Exam 1 reached the value of 1.23 m/s, in Exam 2 it increased to 1.39 m/s, and Exam 3 showed a lower value of 1.15 m/s. During Exam 1 the mean value of the activity in the motor cortex (HEG Ratio Mean) amounted to 71.64 (HEG Ratio Max = 79.58 and HEG Min = 61.60). In Exam 2 the value increased to 92.55 (HEG Ratio Max = 99.20 and HEG Ratio Min = 85.71), and in Exam 3 it decreased to 72.23 (HEG Ratio Max = 76.68 and HEG Ratio Min = 65.77).

Conclusions: It was shown that the rehabilitation program led to improvements in the walking speed, gait efficiency, and dynamic balance, and it favourably affected blood flow in motor cortex of the frontal lobe in the patient after a stroke. The rehabilitation program produced only short-term effects, since these were not sustained at the follow-up two weeks after the patient's discharge from hospital.

Key words: stroke, gait, HEG biofeedback



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The surface geometry of the cement and stems removed due to aseptic loosening of stems endoprosthesis

Introduction: One of the reasons for aseptic loosening of endoprosthesis of hip joint is the loss of compactness of the connection between stem and cement.

Material and results: On the removed surfaces there has been observed the flattening of the local heights (on 6 stem and cement surfaces) and the flattening of the local heights with parallel surfaces irregularities oriented towards the stem displacements (on 6 stem and cement surfaces). Due to different hardness of the co-operating materials the changes on the analysed surfaces occur with different intensity. The values of St stems parameter ranged from 6,67-14,8 μm , cement from

14,8-21,4 μm , Sfd from 2,16-2,25 and were lower than the corresponding parameters of stems and cement removed due to aseptic loosening of the polyethylene cups exploited from 6 to 8 years (St 18 and 40 μm).

Conclusions: Decrease in the value of St parameter and in fractal dimension shortens the life of connections of co-operating surfaces of cement and stem and accelerates the occurrence of aseptic loosening endoprosthesis.

Key words: Weller endoprosthesis, loosening of stem, surface geometry loosening of stem, surface geometry loosening bone



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Frame of mind and risk of the symptoms of depression in patients after maxillofacial trauma – own observation

Background: Injuries to the facial skeleton may result in scars or facial deformities, as well as multiple functional problems. Most injuries of this type lead to decreased self-confidence and to long-lasting social and psychological problems, including depression of varied intensity.

Purpose: Assessment of well-being and risk of depression in patients, following surgical treatment in the region of facial skeleton, at an early and chronic phase after the intervention.

Material and methods: The study involved 42 patients subjected to maxillofacial surgery. The subjects' mean age was 34.5 years \pm 13.2 years (Me=29.5 years); there were more men (n=29, 69%) than women (n=13, 31%). The participants were operated due to ZMO fractures (45.2%), injuries to the body of the mandible (21.4%), mandibular condyle (11.9%), or mandibular angle (9.5%), as well as comminuted mandibular fractures (7.1%), and other (4.8%). The subjects' well-being was assessed using Oral Health Impact Profile (OHIP-14), and the Patient Health Questionnaire-9 (PHQ-9) depression scale. The assessment was carried out twice, i.e. at the acute phase 3 days after the surgery, and at the chronic phase – 8 months after the intervention.

Results: A comparison of the subjects' scores recorded three days and then eight months after the surgery showed im-

proved well-being according to OHIP-14 scale (by approx. 47.4% relative to the initial value), with high significance of $p < 0.001^{***}$ ($p = 0.0000$; $Z = 4.87$), and a change in the risk of depression in PHQ-9 (by approx. 25.9% relative to the initial value) at the level of $p < 0.001^{***}$ ($p = 0.0002$; $Z = 3.71$). The PHQ-9 scores recorded three days after the operation showed mild symptoms of depression in 28.6% of the subjects, and moderate to severe depression was suspected in 33.3% of the patients. At the chronic phase, i.e. 8 months after the operation, depression of varied intensity persisted in 21.5% of the subjects. **Conclusions:** Injuries to the facial bones, in addition to numerous functional and visual consequences affecting the facial region, are associated with a high risk of long-lasting decline in the mental condition. Despite the improvement observed during 8 months following the surgery, symptoms of depression were found to persist in 22% of the subjects. Comprehensive healthcare services provided to patients after maxillofacial surgery should include obligatory rehabilitation and psychological therapy.

Key words: maxillofacial trauma, facial skeleton, traumatology, depression



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Assessment of the cervical range of motion in patients using systemic cryotherapy treatment

Introduction: The aim of the study was to assess the mobility of the cervical spine and back pain in people receiving systemic cryotherapy.

Material and Methods: A prospective, non-randomized study was conducted at the Clinical Department of Physiotherapy of the Provincial Hospital No. 2 in Rzeszów. Those eligible to participate included patients referred to systemic cryotherapy, and patients prescribed physiotherapeutic procedures other than systemic cryotherapy, as well as individuals who reported major functional limitations (pain) in the spine segment. A total of 52 people participated in the study. Systemic cryotherapy was administered to 27 patients (Study Group B1), and other physiotherapeutic procedures were applied to 25 patients (Study Group B2). In order to compare the results, a control group of healthy people matched for age and gender to the study groups was included. The assessments were carried out twice, i.e. before the start and at the end of the treatment program. During the examinations a CROM goniometer was applied to assess the patients' cervical range of

motion, while the severity of pain was measured using a VAS instrument. Each participant received 9 systemic cryotherapy treatments or 9 daily treatment procedures (other physiotherapy treatments).

Results: Statistically significant improvement in cervical spine mobility was demonstrated in the group using basic physiotherapy. The improvement in group B2 was significantly higher compared to improvement in group B1 (cryochamber). In group B1, statistically significant improvement was found only in the range of left rotation ($p = 0.004$). Statistically significant pain reduction was found in both groups at the end of the therapy program.

Conclusions: Better therapy effects related to cervical mobility were observed in the group using basic physiotherapy. The use of systemic cryotherapy in treatment of back pain syndromes did not bring the expected results, which should be taken into account in the planning of treatment.

Key words: spine, pain, physiotherapy



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The Influence of Body Mass on the formation of foot defects in children aged 9-12 years

Introduction: Posture defects, including defects in the shape of feet in school children, covered by one of the most common health problems in this group. The aim of the study was to assess the relationship between the foot shape and body weight of children aged 9-12 from primary school groups in the podkarpackie voivodeship.

Material and method: The study group consisted of 70 children (38 girls and 32 boys). The research used the author's questionnaire. Anthropometric measurements were also made and plantar prints of the test subjects' feet were made. On their basis, indicators characterizing the structure of the foot were determined: alpha, beta and gamma angles, Wejsflog index and Clarke angular index. The relationship between body weight and foot defects in children was determined using Spearman's rank correlation. For other relationships, the Mann-Whitney U test and Pearson's chi-square test were used.

Results: 13 children (18.6%) were underweight, 34 people

(48.6%) were correct body weight, while 23 children (32.9%) were overweight. In terms of shaping the longitudinal arch, most were hollow feet. The Wejsflog index was correct for 51 right (72.9%) and 55 left (78.9%) rates. It was also shown that people practicing sports for at least a year had a lower gamma angle value, both for right ($p = 0.006$) and left ($p = 0.006$). In turn, in children who spent time on various forms of physical activity lasting a total of at least 60 minutes per day, a statistically significant higher value of the right foot Clarke angle was observed. The shape of the feet of the examined children was associated with their body weight only in the case of the gamma heel angle, both for the right and left foot ($p < 0.001$). **Conclusions:** The level of body weight does not affect the formation of foot defects in children. In children with an elevated Body Mass Index (BMI), only increased values of the gamma heel angle were noted.

Key words: foot defects, overweight, body weight, children



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Assessment of static and dynamic balance of children with intellectual disabilities

Introduction: The aim of the study was to assess the parameters of the stabilogram of children with intellectual disabilities compared to children in the intellectual norm.

Material and method: 60 children with mild intellectual disability 40 children and moderate 20 children aged 8 to 14 were qualified for the study. Using the stabilometric platform, the balance in the standing position was assessed in the test with eyes open and closed. Six different parameters of COP (center of pressure) movement were analyzed. The results were compared with a group of 60 children in the intellectual norm aged 8 to 14 years

Results: Studies have shown worse static and dynamic bal-

ance values for children with moderate intellectual disabilities. Children aged 12-14 obtained better standing stability values compared to the younger group (8-11 years).

Conclusions: The degree of intellectual disability affects the static and dynamic balance, worse values are obtained for children with moderate intellectual disability. There are no significant differences between the body balance in the static examination of children with mild intellectual disability to children from the control group. Age affects a higher level of static and dynamic balance of the body.

Key words: intellectual disability, body balance, postural stability



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Assessment of the psychophysical state and quality of life of the older people living in nursing homes in Rzeszów

Introduction: The psychophysical conditions of older people often gets worse due to the occurrence of chronic diseases. As a result it causes of disability or dependence and brings necessity of institutional care admission.

Aim: The aim of the study was to assess the psychophysical state and quality of life of older people living in nursing homes in the city of Rzeszów.

Material and methods: The study population consisted of 100 participants (50 men and 50 women) aged 65-90 (average 81 years) living in the nursing home in Rzeszow. In order to conduct the study, the consent of the directors of the centers and residents was obtained. The research was conducted by direct interview method in August 2019. The research tool used in the study was the: MMSE, GDS, SWLS, WHOQOL-Bref, ADL and IADL.

Results: The overwhelming majority of participants had mild to moderate dementia (91.0%) and depression (93.0%). Most of the older people were independent in performing basic everyday activities (average ADL 5.32 points). The most common problems were activities related to the whole body bath

(23.0%) and movement from bed to chair (19.0%). Most of the respondents did not perform complex daily activities (IADL average 0.16 points). The quality of life was assessed at a fairly good level. The average overall quality of life was 57.63 points WHOQOL-Bref. The lowest quality of life was noted in the somatic domain (30.75), while the highest in the environmental domain (91.05). Average life satisfaction indicated a lack of satisfaction and was 13.22 points on the SLWS scale.

Conclusions: The surveyed residents of nursing homes in Rzeszów were characterized by cognitive and emotional disorders as well as average level of quality of life and lack of life satisfaction. In addition, they were characterized by a fairly good level of functional efficiency in performing basic everyday activities. The scope of research should be increased, especially in the area of assessment of factors affecting the somatic domain of quality of life and sense of satisfaction with life, as well as the impact of intervention programs translating into their improvement.

Key words: aging, quality of life, psychophysical state, care for the elderly



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The needs and possibilities of a measurable assessment of the effects of children's rehabilitation

The child's psychomotor development consists in gradually achieving more and more control over his body and its movements in space. In subsequent stages of development, new, more complex motor activities and more precise motor behaviors appear, and thus greater fitness and physical activity. The assessment of the quantity and quality of psychomotor development is both the basis for early recognition of disorders resulting from the central and peripheral nervous system and the locomotor system, but also is a tool for assessing the effects of treatment and rehabilitation undertaken here. Although various tools are used to assess psychomotor development, such as tests, trials and scales, there is still a measurable tool in Poland to assess the child's motor development.⁵ The most valuable tool is one that assesses child development at every stage in terms of both quantity and qualitative, i.e. it checks not only the occurrence of a given feature, i.e. the fact of performing a specific motor task, but also its quality, i.e. how it was performed. Therefore, on the KRF's initiative, the functional assessment scale for patients aged 0-7 was developed – developed by the Thematic Team for Quality and Monitoring of Physiotherapy Processes.

The scale is based on the observation and spontaneous activity of the child in the field of: 1) postural control (the ability to

take and maintain specific positions); 2) motor control (high motor skills) and observation combined with obtaining answers to questions posed to the child's parents / guardians in the scope of 3) dexterity (small motor skills), and 4) self-service - in accordance with the following criterion: 2 points - independently accepts and maintains the position, or performs motor activity independently, 1 point - assumes the position with physical assistance and maintains independently; or performs motor activity with physical help, 0 points - cannot take and hold position, or does not perform motor activity

The assessment consists in calculating the individual Activity Index (AI) of the child determined in each of the following 4 domains: 1) postural control (AI1); 2) motor control or high motor skills (AI2); 3) agility or fine motor skills (AI3); and 4) self-service (AI4). Each activity indicator is a measure of the child's current level of activity and the higher it is, the higher the child's level of global activity is, as well as separately - in a given category.

Monitoring of AI changes both in the course of motor development as well as under the influence of treatment or rehabilitation will allow for objective evaluation of their effects.

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Case study: The use of neurofeedback method in neuropsychological rehabilitation of patient after stroke

Introduction: One of the dramatic consequences of stroke is mild or severe cognitive impairment. The reported prevalence of cognitive deficits in the first month after stroke ranges from 10% to 82%, mainly depending on the used cognitive impairment criteria and the patient selected population. Cognitive impairment worsens proportionally to time if not properly treated. The most common cognitive deficits include deficits in attention, visuo-spatial functions, memory and executive functions. These cognitive deficits are mostly due to a combination of several neurological disorders occurring in an acute cerebrovascular disease. This attenuation may be due to various factors including the location of stroke, cerebral hypoperfusion, the functional deactivation of distant areas in the brain, or due to the pressure exerted by the lesion on surrounding brain tissue. Other concerns concern the long-term, as cognitive impairment of people after stroke is 12-56%, much more than the age-related cognitive decline rate of 5-10% in normal adults. The first goal in rehabilitation is to determine, through neuropsychological examination, what cognitive, behavioral and emotional changes can be attributed to a stroke. This information provides the basis for predicting functional outcomes and treatment plans. Regarding cognitive rehabilitation after stroke, the neurofeedback method could represent a promising tool for cognitive rehabilitation. There are several studies suggesting that neurofeedback training (NFT) can be used to enhance patient cognitive performance.

Objective: To examine the effectiveness of long-term individualized neurofeedback training as part of comprehensive neuropsychological rehabilitation.

Design: Single case study.

Subject: A 65-year-old male after an ischemic stroke, with MR finding of recent focal ischemia occipital stroke left sided with multi-infarct encephalopathy present supratentorial bilateral. State after isolated intraaxial microhemorrhagia supratentorial bilateral.

Method: Neurofeedback training was performed for 6 months, several times a week, but at least 2-times and at most 5-times a week. Each training was preceded by an initiation measure-

ment followed by a qualitative analysis and determination of training options according to the measured values and set goals of the mental state of the patient. Inhibition of slow waves, especially theta activity (4-8 Hz), inhibition of increased arousal (19-23 Hz) and hypervigilance (24-36 Hz) dominated. In particular, the SMR (12-15 Hz) and the beta 1 band (15-18 Hz) were strengthened, corresponding to rational, logical thinking correlating with the cognitive activity of active problem-solving and narrow focus. One-channel training was performed in the placement of electrodes Cz, Pz, P3, O3, Oz. The patient received real-time visual-auditory feedback upon successful fulfilment of predetermined conditions. **Results:** Repeated neuropsychological examinations after two and six months showed a significant improvement in patient cognitive performance at the overall level of attention and reduced mental activity congestion. In the patient's cognitive profile, we see an improvement in the global cognitive performance. We have also identified improvements in verbal-auditory memory, long-term memory, executive performance in the areas of abstraction, mental flexibility, interference, set-shifting, planning, visuo-spatial functions, and psychomotor activity. Independence in daily life activities has also improved.

Conclusion: After the acute phase of stroke, cognitive rehabilitation plays a key role. Although there are many different types of potential training, there are differences in the findings on the effectiveness of such interventions. Despite these limitations, improvements in cognitive performance have been identified in the present patient. It is important to note that neurofeedback training offers users a number of benefits, including a highly individualized approach to treatment. Based on theoretical considerations in line with the findings of other research studies, we assume that neurofeedback training can help improve cognitive performance of patients after stroke and thus contribute to complex neuropsychological rehabilitation.

Key words: neuropsychological rehabilitation, stroke, neurofeedback training, case report



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Types of injuries and factors of their occurrence in youth training volleyball

Introduction: Practicing a sport lead to many benefits, especially health benefits, but is also associated with the occurrence of injuries. Volleyball is one of the most popular team sports. The high level of players' game requires them to participate in numerous training sessions and to participate in many competitions. Increasing loads and improper motor preparation can lead to various types of injures. The purpose of the work was to determine the type of injury, their location, and the factors leading to them among young athletes practicing volleyball. The purpose of this research was to determine the type of injuries and their location, as well as the factors leading to injury among youth training volleyball.

Material and methods: The study was conducted on 100 volleyball players, attending to the School of the Sports Championship in Rzeszów. A questionnaire of own authorship, which

was created for the needs of this article, consists 21 questions, considering occurrence of injury.

Results: 90,91% of the players were injured. Most of them 53,33% concern men. The most common injury, was an ankle sprain - 26,66% . The majority of injuries, occurred during the training. In most cases, the athletes were injured during the training – 83,33%. The main cause leading to injury was the landing after block or attack – 86,66%. There were no significant differences in the types of injuries, their location, or the factors leading to them depending on the gender.

Conclusion: The most common injury among youth volleyball players was an ankle sprain. Supplementing standard training with preventive exercises, especially proprioception, can reduce the incidence of injury to players.

Key words: injures in sport, ankle sprain, volleyball

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Viral hepatitis A as a model for vaccine-preventable infection

Introduction: for 17 years (since 2003), vaccination of children and adults has been carried out in Minsk with the use of inactivated vaccines. The epidemiological effect obtained during the implementation of hepatitis A vaccination prevention strategies allows us to consider hepatitis A as a vaccine-controlled infection. Routine immunization was carried out among the children aged 18 months and 6 years twice with an interval of 6 months with drugs. Vaccinations according to epidemiological indications were subject to contact persons in the foci of hepatitis A, as well as persons with a high risk for the disease.

Material and methods: data on cases of hepatitis A registered in the territory of the city of Minsk for the period from 1992 to 2018 ($n = 7002$), the number of people vaccinated against hepatitis A ($n = 431427$) in the age groups of the population of Minsk and data on cases of the disease of vaccinated and unvaccinated people. Data on epidemic foci ($n = 630$). The parameters of the hepatitis A epidemic process were studied and compared in pre-vaccination period (1992–2003 years) and vaccination period (2004–2018 years). Epidemiological and statistical research methods were used.

Results: The parameters of the epidemic process of hepatitis A in the pre-vaccination period are established: 8-year cycle; autumn-winter seasonality; high risk of disease and spread of

infection in the age groups of 3–6 and 7–14 years. The parameters of the epidemic process of hepatitis A in the vaccination period were revealed: a decrease in the intensity of the epidemic process, the absence of cyclicity, the absence of a seasonal rise, low focality. The long-term average incidence for the vaccination period was 2,6 cases per 100000 population. In the age group of children of 3–6 years, the average long-term incidence rate decreased by 90,2 times, in the group of children of 7–14 years of age - by 39,4 times. The proportion of children 3–14 years old in the structure of patients with hepatitis A was 6,2%. In 2019, only 18 cases of hepatitis A were registered. Under vaccination conditions, the age structure of patients is dominated by people aged 20–29 years (34,5%) and 30–39 years (29,4%). Age-related drift in incidence is a typical sign of a vaccine-preventable infection. The migration factor accounted for 22,3% of diseases.

Conclusions: The epidemiological effectiveness of mass vaccination against hepatitis A among children was 95,0%; in epidemic foci, the vaccination efficiency was 68,4%. The average incubation period of the secondary case in the outbreak was established ($24 \pm 1,5$ days).

Key words: IDUs, HIV-infected, substitution therapy, antiretroviral therapy.



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Assessment of patients after total knee replacement with use patient-self reported outcome measure

Introduction: In recent years special attention is put on the meaning of self-reported assessment of the patients. Depending on the questionnaire used, this type of assessment allows gathering the patient's opinion without the clinician's bias about the state of health, quality of life or functioning in daily living and better adapt therapies to the patient's abilities and expectations.

Material and methods: The study involved 60 patients (average age 66,7, 48 women and 12 men), who were qualified for total knee replacement (TKR) surgery due to advanced knee arthrosis. The Knee Outcome Survey in Activities of Daily Living (KOS-ADL), Knee Injury and Osteoarthritis Outcome Scale (KOOS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and Visual Analog Scale

(VAS) were used to assess patients. The assess of patients took place twice, one week before and six month after the surgery.

Results: Significant statistical improvement of patient's condition after total knee replacement we demonstrated in all sales used: KOS-ADL (p 0,000), KOOS (p 0,000 for all subscales), WOMAC (p 0,000), VAS (p 0,000). Effect size was calculated for changes in all scales: KOS-ADL (5,09), KOOS (2,36, 4,99, 4,13, 1,28, 2,56 for each subsale), WOMAC (3,40), VAS (4,46).

Conclusions: The study showed that all questionnaires used are adequate to assess patients qualified for total knee replacement.

Key words: knee arthrosis, total knee replacement, patient-self reported outcome measure



Gamracki Grzegorz

Diaphragm system in the human body Practical aspects and use in therapy

When we think about diaphragms, the respiratory and, most likely, genitourinary diaphragms come to mind, but in the human body there is a whole system of mutually affecting membranes (diaphragms). From the skull to the feet, they ensure the proper distribution of mechanical forces as well as fluid circulation between tissues.

The workshop aims to approximate structural, vascular, nerve and functional interrelationships between membranes. A pro-

posal of diagnostics as well as easy techniques regulating the work of given areas will be presented in order to restore proper functioning. If you are looking for diagnostics and therapy for patients connecting many systems at once, this workshop will be very useful for you.

Key words: diaphragms, therapy,



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Changes in selected orofacial functions in stroke patients undergoing rehabilitation

Introduction: Initially, stroke is considered the second most common cause of death for people over the age of 60, the second most common cause of dementia, and the most common cause of permanent disability. Dysfunctions of the stomatognathic apparatus are a rarely discussed aspect in rehabilitation.

Aim: The aim of the study was to assess selected changes in oral function in patients after acute cerebral vascular cerebral incidents who underwent early, comprehensive neurological rehabilitation.

Material and methods: of research among 60 people (26 women - 43.33% and 34 men - 56.67%), aged 34 to 84, staying at the Neurological Rehabilitation Ward of the Bonifraterski Centrum Zdrowia in Piaski for a minimum of 10 weeks. For analyzes subjected to the stomatognathic system, motor skills

of the tongue, lips, movement of the jaw during speech. Submission of research results obtained by the Bioethics Committee at the Medical University of Karol Marcinkowski, the Directorate of the Center and the Person.

The results: of language motility and sensation were impaired in 19 (31.67%) people on the day of admission to the ward and in 7 (11.67%) after undergoing treatment, while lip motility in 22 (36.67%) subjects and improved in 5 (8.33%) people. Some voice disorders improved significantly in 17 different 35 patients.

Conclusions: Conducting research on the analysis of selected functions in the field of oral cavity application after acute cerebral vessels cerebral incidents, subjected to 10 weeks of comprehensive neurological therapy.

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Principles and methodology for applying treatments from the physical medicine to patients after oncological treatment

Introduction: Cancer is the growth of the body's own cells that are not subject to natural control mechanisms. Tumors most often spread through infiltration into neighboring organs, and malignant tumors are able to produce daughter cells that distant metastasis. Oncological treatment shows some aggressiveness not only towards cancer cells but also for healthy tissues adjacent to the lesion, and in the case of using cytostatics also for the whole organism. Specialized treatments in physical medicine used after oncological treatment are aimed at: alleviating the effects of the disease and therapy, preventing complications and/or eliminating the symptoms of complications, normalizing conditions for basic metabolic processes: tissue breathing, blood supply, improving the functioning of system tissues, skin revitalization, action analgesic and anti-inflammatory, improving well-being by improving appearance. **Aim of the study:** Review of currently used physical treatments after oncological treatment, which includes phototherapy (Nd:

YAG fractional lasers; LED light - polarized, wavelength 580-900 nm; IPL device with the option of using spectral width filters), electrotherapy (microamperage electrostimulation: a) sensory - analgesic, b) motor, c) stimulation stimulating microcirculation; TENS (Transcutaneous Electrical Nerve Stimulation) method in the treatment of acute and chronic pain; direct current) and ultrasound (cavitation peeling - 3MHz frequency; traditional use of ultrasonic therapy - 0.8-2.4MHz frequency), as well as the use of mud preparations and hydrotherapy. The rules of applying treatments require full individualisation, taking into account the specific treatment situation. **Summary:** Clinical verification of the use of physical medicine procedures after oncological treatment allows to draw conclusions about their positive effect in the treatment of the effects of therapy and complications in the distant time.

Key words: cancer, oncological treatment, physical therapy



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The use of proprioceptive neuromuscular facilitation method (PNF) in improving patients following knee joint arthroplasty

Introduction: Total knee arthroplasty (TKA) is the gold standard in treating end-stage of knee osteoarthritis. In most patients a long-term improvement and less pain are recorded, however recovery process varies. The goal of the study is to evaluate effectiveness of PNF method used in an early stage of postoperative period in comparison to a classic physiotherapy course in patients following TKA.

Material and methods: The study included 96 patients- 64 women and 32 men aged 54-83 who were qualified to TKA due to knee osteoarthritis and pain. The study was performed in the years 2015-2017 as part of standard procedures within Orthopedic Ward of Cracow Rehabilitation and Orthopedic Center (KCRiO). The patients were randomized into two groups. Rehabilitation started in both groups directly after the operation. A control group- 33 patients, underwent a classic physiotherapy program used in KCRiO in patients following TKA in which mainly open kinematic chain activities are performed. The study group- 63 patients, was treated with PNF method. Parameters presenting functional abilities

of patients and subjective pain level were collected with the help of independent questionnaires and scales: Lequesne Index, Staffelstein Score, Laitinen Scale, EQ-5D Scale, Tapper Scale and the pain scale VAS. Tested parameters were also: muscle strength (Lovett scale), range of motion of the knee and ankle joint and circumferences. The tests were done twice, on the date of admission to the ward and in the last (the 10th) day of rehabilitation.

Results: Results showed that the proposed treatment algorithm using PNF method had statistically significant positive effects in decreasing pain ($p < 0.05$), increasing independence in activities of daily living ($p < 0.05$) and increasing subjective level of life quality ($p < 0.05$).

Conclusions: A detailed comparative analysis presented in this study allows to indicate PNF method as an effective therapy which is worth to be considered in planning rehabilitation process in early-stage patients following TKA.

Key words: PNF, closed kinematic chain, total knee arthroplasty



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The influence of physical training on the lipid profile and blood glucose level as well as on the the body fat content in overweight and obese people

Introduction Characteristic features of obesity are: changed lipid profile: elevated levels of triglycerides and LDL cholesterol also increased glucose concentration in blood, as well as a change in body composition including mainly fat. The aim of the study was to demonstrate the impact of physical training combined with diet on blood lipid profile, blood glucose concentration and body fat content.

Material and methods 86 overweight and obese women were qualified for the study. All people were engaged in a 3-month weight loss program run by CM MEDYK in Rzeszów, consisting of regular physical training combined with diet. At the beginning of the program and after its completion, venous blood was collected and serum lipid and glucose parameters were determined. In addition, body composition was measured and the change in body fat was examined.

Results After three months of physical training and dietary, it was found that the levels of triglycerides, total cholesterol,

LDL and HDL cholesterol were reduced. No statistically significant change in blood glucose level was observed. There was no correlation between the age of the respondents and the size of changes in mentined parameters.

Conclusions

- 1) Physical training combined with diet has a beneficial effect on the lipid profile of people struggling with overweight and obesity.
- 2) Physical training in combination with a diet allows to reduce the percentage of body fat.
- 3) Rational physical training and diet give a similar positive effect on the lipid profile and body fat content in people of all ages.

Key words: obesity, physical training, blood lipid profile, body composition



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The effect of the postural exercises in young school agents

Introduction: The purpose research is to find out the need for enrich physical activities of pupils in physical education lessons by postural exercises. The goal of this research is to prove the positive effect of this exercises to the quality of the posture.

Material and methods: 49 elementary school pupils participated in the research. There were 29 boys and 20 girls with the age average 13,9 years. Pupils were included in the research after the parents' written consent. The quality of posture was determined by Klein, Thomas, modified by Mayer. After the 6 month of the performing the exercises of posture of axial system we did the control examination.

Results: The results of the T1-T4 typology showed an average value 3,27. At the control examination was the average value of the T1-T4 typology 2,41 (p value: 0,00032).

Conclusion: The results of this research demonstrate the need for inclusion of the postural exercises to the common activities of the physical education lessons in elementary school. This thesis also gives the idea of the need for instruction of this exercise methods to the teachers of physical education lessons.

Key words: Postural exercises in physical education lessons. Quality of posture. Posture of young school agents.

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Estimating minimal clinically important differences for knee range of motion after stroke – part I gait

Introduction: The purpose of this report was to estimate MCID values for knee range of motion in the sagittal plane for the affected and the unaffected side in the late period after stroke. We chose to estimate MCID values using: a patient anchor-based method, distribution-based method, linear regression analysis and specification of the receiver operating characteristic (ROC) curve.

Material and Methods: The study involved 50 individuals after a stroke in a chronic phase of recovery. Kinematic knee data were collected with a six-camera motion capture system BTS SMART. The Barthel Index was determined twice, i.e. at baseline and during a follow-up assessment. The MCID for the knee range of motion (ROM), for the affected and the unaffected side, was determined using four methods, and finally the highest result identified was selected.

Results: In the anchor-based study, the mean change in knee flexion/extension ROM for the affected/unaffected side in the

MCID group was 8.48 degrees/6.81 degrees, which constituted the first estimate of the MCID. In the distribution-based study, the standard error of measurement for the no-change group was 1.86/5.63, constituting the second estimate of the MCID of the knee sagittal ROM for the affected/unaffected side. Method 3 analyses showed to 7.71/4.66 change in the range of motion corresponding to 1.85 change in the Barthel Index (the third MCID estimate of the knee sagittal ROM for the affected/unaffected side). The best cut-off point, determined with ROC curve, was the value corresponding to 3.9/3.8 degrees of change in the knee sagittal ROM for the affected/unaffected side (the fourth MCID estimate).

Conclusions: We have determined that MCID estimates of the knee sagittal ROM for the affected side amount to 8.48 and for the unaffected side to 6.81 in chronic stroke.

Key words: gait, minimal clinically important difference, stroke



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Soft tissue mobilization and Kinesiology Taping in the frozen shoulder syndrome. Functional assessment and therapy strategy

Frozen shoulder syndrome is a very complex clinical problem. Comprehensive structural preparation and functional work can accelerate recovery to patient's health. Functional assessment based on muscular imbalance assessment allows to verify which myofascial structures are overloaded. The planned work strategy and cooperation with the patient can guarantee the best therapeutic result.

Orthopedic, neurological and functional examination allows assessment of myofascial structures and selection of appropriate therapeutic techniques. Patient evaluation includes AROM, PROM and resistance tests. The therapy involves performing techniques in the field of myofascial relaxation, active techniques relaxation and trigger point therapy. An additional element of therapy support is the use of functional Kinesiology Taping to consolidate the effect of soft tissue therapy

and reduce the sensory sensitivity of the shoulder complex. The most commonly used techniques of Kinesiology Taping are: muscular, ligament, correction and functional fascial taping.

Experience in working with patients with frozen shoulder syndrome indicates very good effects of improved function using the methods of soft tissue mobilization and Kinesiology Taping. An indispensable element of obtaining a beneficial effect is the autotherapy by the physiotherapist at the patient's home involving the stretching of shortened soft tissues.

Soft tissue mobilization and Kinesiology Taping are safe and effective therapeutic procedures for shoulder dysfunction complex including frozen shoulder syndrome.

Keywords: frozen shoulder, Kinesiology Taping, therapy



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Headaches in terms of physiotherapy

Introduction: Headache is a problem most people experienced in some point of their lives. Very common cause of headache, which physiotherapy helps to eliminate, is problems with the neck and spine. Therefore, the theoretical part of the thesis focuses on anatomy and kinesiology of cervical spine and cervicocranial connections, mechanisms of pain perception, general division of pain and its evaluation.

Material and Methods: 214 respondents who participated in our questionnaire survey were divided into two groups by type of employment. The first group is people with a non-sedentary job, 93 respondents, the second group consists of people with a sedentary job, 121 respondents. The main goal of the thesis is to find out what impact the type of employment, sedentary and non-sedentary, has on the occurrence of headaches, and, at the same time, to find out how people deal with headaches and whether headaches with varying intensity have an impact on everyday activities. In processing the results, we used the mathematical and statistical functions of MS Excel 2019 for statistical evaluation.

Results: In the work we confirmed that the nature of employment (non-sedentary / sedentary) affects the nature of the headache. 50,98 % of respondents experienced dull headache with sedentary employment and 31,51 % with non-sedentary employment. The frequency test showed that there was a statistically significantly higher incidence of dull headache in people with sedentary jobs. However, the most numerous was the pressure headache reported by 49,71 % (87 out of 175) respondents.

Conclusions: We found that people with sedentary jobs suffer from headaches more frequently than people who do not have a sedentary job. The most common way of eliminating pain in our respondents is to use pain medication. We also found that, with increasing headache intensity, the limitation in daily activities also increases.

Key words: Cervical headache. Cervical spine. Rehabilitation. Employment.



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Improvement of a 44-year-old patient after hip joint endoprosthesis – case report

Introduction: Osteoarthritis is the most common joint disease, affecting 8 million joints Poles. Endoprosthesis is a method of treatment of advanced changes in the hip joint, which significantly improves the quality of life. The aim of the study was to evaluate the influence of hip endoprosthesis (alloplasty) on the quality of life of a patient with osteoarthritis of the hip joint.

Material and methods: For the functional assessment of the patient, the following were used: walk speed test, two weight test, subjective evaluation of pain, itness and well-being by means of numerical scale (NRS), as well as measurement of femoral perimeter of the operated limb.

Results: After 21 days of rehabilitation, an improvement was achieved in the test of two scales. The load difference of the

left leg decreased by 19 kg, the speed of gait improved twice, and subjective evaluation of pain was determined to be mild, well-being for good and fitness for a slight loss. The swelling has decreased by 6 cm.

Conclusions:

1. Endoprosthesis of the hip joint has significantly improved the quality of life of a patient affected by hip degenerative disease.
2. In the process of rehabilitation it is very important to involve the patient himself, who strives for the best possible outcome of the rehabilitation process.
3. Patients with active lifestyle recover faster after any surgery.

Key words: osteoarthritis, rehabilitation, hip arthroplasty



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Application of Cheerleading Elements in the Pre-School Physical Therapy Program for Chest Deformed Children

Introduction: Improper development of the chest causes displacement and compression of the internal organs, which leads to various disorders of their function.

Aim: To improve the physical therapy program for preschool children with chest deformities in a cheerleading club.

Material and method: We examined 16 girls 5-6 years with a funnel-shaped chest. Analysis and generalization of data of scientific and methodical literature, anthropometry, spirometry, 6 min walk test, methods of mathematical statistics.

Results: Based on the examination and literature data, we found that children with chest deformity have the following problems: functional disorders of the cardiovascular and respiratory system, disorders of the metabolism; reduction of the protective and skeletal function of the chest; pain in the front chest; lack of endurance; cosmetic defects that lead to the development of pronounced psychological disorders. Our physical therapy program consisted of practical (massage and special exercises in combination with basic cheerleading exercises) and theoretical (parent training on the impact of ex-

ercise on child development and posture correction; morning hygienic features) parts. We choose the exercises for posture correction individually, taking into account violations (frontal, sagittal plane) in this child. When performing the exercises, we focused on the phases of breathing, which not only contributes to improving the functionality of the respiratory and cardiovascular systems, but also active correction of the chest. We recommended for parents a morning hygienic gymnastics complex that included breathing exercises, spine lability exercises, and general muscular strengthening and a special place was given to the education of parents.

Conclusion: Our physical rehabilitation program has proven to be effective for preschool children with a funnel-shaped chest. VC indicators increased by 18.5%, Shtange samples by 32.1%, Genchi samples by 71.17%, excursion of the chest by 9.1%, distance traveled by 6 min walking test by 12.64% ($p < 0.05$).

Key words: children, funnel-shaped chest.



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The precursor activity of dr J. Aleksiewicz in the field of osteoarticular tuberculosis treatment in Poland in the 'Sanato' Sanatorium in Iwonicz-Zdrój

The authors, based on source materials owned by the family of dr. J. Aleksiewicz and on the basis of a few articles published in medical journals and daily newspapers, present the precursor activities of dr. Aleksiewicz in the field of osteoarticular tuberculosis treatment in Poland. In 1912, dr. Aleksiewicz finished medical studies at the University of Lviv and worked in the Surgical Clinic headed by prof Ludwik Rydygier. In 1919, he launched the first orthopedic hospital in Lviv together with a prosthesis factory and a private Orthopedic Clinic. In 1921, he became a Chief Doctor of the spa facilities in Iwonicz-Zdrój, where he ran a branch of the Lviv orthopedic clinic. During this period he made several foreign scientific trips to the best

medical centers treating cases of osteoarticular tuberculosis. In 1925, using his own financial resources, he began to build the first sanatorium in Poland specializing in the treatment of such cases. The Sanato Sanatorium was opened in 1930. Until the outbreak of World War II, Dr. Aleksiewicz conducted diagnostics, operative and conservative treatment mainly of osteoarticular tuberculosis in children. Based on the treatment experience of the best Western centers, he widely used physical methods: heliotherapy, Swedish therapeutic gymnastics, mechanotherapy, massage and balneology.

Key words: history of medicine, rehabilitation, physical medicine, tuberculosis.



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Hormonotherapy or physiotherapy? Integration of treatment methods in breast cancer – a case study

Introduction: Breast cancer is one of the most common cancers among women. Its occurrence among increasingly younger patients is observed, and most often affects women in the post-menopausal period. Undertaking early treatment, prophylactic measures and appropriate therapy at an early stage significantly improves the quality of life in the physical, mental and social spheres.

Case study: The case study concerns a sixty-three-year-old woman diagnosed with left breast cancer, suffering from the disease since July 2019, fully independent. The paper presents the undertaken and implemented treatment in the examined woman, the influence of the family on the patient's mental support and the effect of physiotherapeutic management.

Discussion: Form of breast cancer is a multidimensional prob-

lem. It provides the possibility of choosing different treatments and therapy. Treatment methods developed over the years significantly extend the life of patients. One such method is hormonotherapy, which is sometimes the treatment of choice, and at the same time is effective and has less harmful side effects as opposed to chemotherapy. A complementary therapy can be the physiotherapy process. It prevents complications, reduces pain and improves the physical condition of patients.

Conclusions: Breast cancer has multifaceted consequences. Family support is an integral part of the first phase, concerning the mental sphere. The integration of hormonotherapy and the process of physiotherapy combine targeted treatment and the reduction of existing ailments.

Key words: breast cancer, hormonotherapy, physiotherapy



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Functional efficiency and evaluation of the quality of life of older people living in Nursing and Care Home in Strzyżów

Introduction: The aim of the study was to evaluate the quality of life and functional efficiency of patients in the Nursing and Care Home in Strzyżow.

Material and methods: The study was attended by 47 people of old age. The methods and scales used in the research were: WHOQOL-BREF, Barthel, VES-13, ADL.

Results: Patients feel that they are satisfied with their quality of life, but their performance is low. They evaluate their health at a medium level.

Conclusions: 1. Patients in the Nursing and Care Home confirmed that their quality of life is significantly good and they

are satisfied with it, as shown in the WHOQOL-BREF survey. They rated the quality of life best in environmental terms.

2. As research has shown, few of the patients were able to perform self-service activities, especially moving from bed to chair and back. Their functional efficiency was low.

3. There was a significant statistical relationship between the functional status of the subjects and their quality of life. The better the functional condition of seniors, the better the quality of life in the somatic domain and the weaker in the psychological, social and environmental domain.

Key words: geriatrics, quality of life, functional efficiency



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Diagnosis and therapeutic management of people after a spinal fracture in the course of osteoporosis

Introduction: Spinal fractures in the course of osteoporosis are among the most common fractures in people over 60 years of age. In osteoporosis, vertebral fractures are most common. The stem, due to its structure, containing a spongy mass and in relation to this mass, a much smaller content of cortical matter is prone to fractures.

The term insufficiency of the spine can be understood as its imperfect support effect for the entire skeletal system and skull, easy fatigue of the paravertebral musculo-ligament system, loss of physiological curvatures leading to a decrease in the cushioning role and intervertebral disc disorders at the level of discs and intervertebral joints. In the course of osteoporosis, we meet certain types of spinal fractures

I. Slow fractures of the spine, which occur most often as a result of the slow action of internal compression forces while

weakening the trabecular structure of the spongy part of the shaft. Slow fractures are usually diagnosed accidentally during imaging diagnostics involving the spine.

II. Low-energy fractures of the spine, which arise as a result of the effects of small forces, usually compression or flexo-compression, e.g. when sneezing, coughing, changing body position or lifting.

III. High energy traumatic fractures of the spine in the elderly. These fractures occur when he is subjected to large traumatic forces that lead to adequate bone damage. These fractures are more likely to have neurological complications. The paper discusses the character of osteoporosis fractures and methods of conservative and interventional treatment.

Key words: fractures, osteoporosis, spine, treatment



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Climatotherapy as part of a comprehensive treatment the mental state of patients with chronic obstructive pulmonary disease

Introduction: Chronic obstructive pulmonary disease (COPD) is a progressive lifelong disease that often leads to disability and premature death. Pulmonary rehabilitation along with physical therapy is the basis for rehabilitation of patients with COPD. However, one in four people with COPD are estimated to have clinically significant depressive symptoms.

Objective: The aim of the work was to find out the incidence of depression and anxiety in patients with COPD and to evaluate the mental state of patients before and after undergoing climatotherapy combined with speleotherapy.

Methods: Our study included 30 patients, 9 women (30%) and 21 men (70%) with an average age of 62.4 years (SD ± 12.18). The patients underwent climatotherapy together with speleotherapy for 21 days in the Sanatorium Tatranská kotlina, n.o. Speleotherapy was performed 4 times a week for 50 minutes, which is 10 to 12 times during the stay. Investiga-

tions included spirometry (FEV₁ and FEV₁/FVC), depression assessment (Zung scale), anxiety (Beck scale), and a 6-minute walk test (6MWT).

Results: After treatment, there was an increase in mean FEV₁ (p<0.05). There was no statistical significance in FEV₁/FVC (p>0.05). Signs of anxiety appeared in 23 patients (79.7%) and depression in 8 patients (26.7%). The treatment effect observed was on the Beck's anxiety scale (p<0.05). Pearson correlation revealed a significant relationship between physical activity (6MWT) and anxiety (p<0.05).

Conclusion: Climatotherapy together with speleotherapy have been shown to be an effective combination in the treatment of anxiety as a major co-morbidity in COPD.

Key words: Climatotherapy. Chronic obstructive pulmonary disease. Depression. Anxiety.



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Factors related to the prevalence of anemia in hospitalized elderly people aged 80 years and over

Introduction: Anemia is considered a factor that significantly increases the risk of disability and mortality in the elderly.

Aim: The aim of the study was to assess the relationship between the occurrence of anemia in hospitalized women and men aged 80 years and over and selected determinants of motor fitness and to identify the value of individual tests from which anemia can be predicted in this group.

Material and methods: The analysis included 91 women and 57 men aged 80 and over hospitalized in the Geriatric Department of the Przeworsk Hospital in the period from January to September 2019. The hemoglobin concentration in the blood was assessed in the center's laboratory. Anemia was diagnosed according to WHO guidelines. The study also used hand grip strength measurement using a hand dynamometer (Jamar), Timed Up&Go test, getting up from a chair test and the Berg

Balance Scale test. Logistic regression model was used in statistical analysis.

Results: A statistically significant relationship was found between the hand grip strength and the occurrence of anemia in the men group. A 1 kg increase in muscle strength reduces the risk of anemia by 12.7%. Based on the ROC curve, it was found that the value of hand grip strength from which anemia can be predicted in a group of men is 24.4 kg. In the female group no statistically significant correlation was found between the occurrence of anemia and the analyzed variables.

Conclusions: The measurement of hand grip strength is a non-invasive and easily accessible tool that can contribute to early referral of the patient for detailed diagnostics for anemia.

Key words: anemia, aged, hand grip strength, motor fitness



Klemm Johannes

Krankenhaus Winsen

Galileo Vibration Therapy a new option in modern physiotherapy?

The principle of Galileo is based on the natural movement of human gait.

Galileo's side-alternating motion is similar to a seesaw movement with variable amplitude and frequency, and therefore stimulates a movement pattern similar to human gait.

The rapid movement of the training platform causes a tilting movement of the pelvis, just like when walking, but much more frequently.

To compensate, the body responds with rhythmic muscle contractions, alternating between the left and right side of the body.

From a frequency of about 10 hertz onwards these muscle contractions are not a conscious process but, rather, are a reflex. This stretch reflex activates the muscles in the legs, the stomach and the back right up into the trunk.

Galileo vibration for the pelvic floor therapy and incontinence

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Effect of Ultrasound therapy in temporomandibular joint dysfunction

Introduction: The application of ultrasound by semidynamic form, in the treatment of the disease of temporomandibular joint (TMJ), therapy affects the ability of the TMJ moving while eating, swallowing, chewing, speaking and face expression. Currently, an ultrasound is applied with a small head type up to 1cm² with a minimum intensity and a half time of application for TMJ failure with motion deficiency.

Aim: The aim of this study is, in the selected group of patients, emphasizing the importance of an effective application of an ultrasound, to affect the spasm of M.masseter and muscle in the site of the temporomandibular joint.

Material and methods: In the research part of the work, we present a group of patients with the temporomandibular joint dysfunction. This group was consisted of 27 women and 18 men in the age range of 18-78 years with and average age of

56,16 years. We evaluated the range of mobility of the mouth opening and palpation chewable muscles after completing the physiotherapy in the duration of two weeks.

Results: In patients following 10-day physiotherapy, the aim was to eliminate the temporomandibular joint dysfunction, the spasm of the muscles in the TMJ area and the chewing muscles area. As a result, we restored the range of TMJ mobility with physiological mouth opening.

Conclusion: The results of the therapy confirmed, that the application of ultrasound by the semidynamic form in the treatment of the temporomandibular joint dysfunction, therapy affects the spasm of m. masseter and muscles around the TMJ and consequently the ability to move TMJ.

Key words: Ultrasound. Temporomandibular joint. Function disorder.



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Assessment of obesity and posture in school age children

Introduction: Obesity is, according to WHO, one of the biggest health's problem of people all over the world. It is becoming a pandemic of modern society. Obesity is also an enemy of children and youth. According UCN (2017) up to 155 million children and adolescents are overweight. Obesity causes various diseases One of it's are postural disorders.

Methods: The study was carried out in the school year 2018/2019. The study included 30 children (13 girls and 17 boys) at the first stage of primary school, aged 7-10 years (average age 8.2). The study was carried out with the consent of legal guardians. In children we monitored BMI, amount of subcutaneous fat and postural status. The aim was to evaluate whether overweight and obese children have postural disorders and vice versa. BMI was evaluated by standardized method - $\text{weight (kg) / height (m)}^2$. Subcutaneous fat was measured using calliper and it was evaluated according to Pařízka. The posture was evaluated by the Thomas and Klein method modified by the Mayer. The results were processed in MS EXCEL.

Results: The mean BMI in children reached 18 (in children

earlier, there was a reduced weight). The arithmetic mean of the percentage of subcutaneous fat was 18.62. Perfect posture occurred in 3 (10%) children, good posture had 10 (33%) children, poor posture had 11 (37%) children and very poor posture had 6 (20%) children. Subsequently, we selected children with BMI higher than normal. In overweight and obese children, poor posture was the most prevalent in 60%. In second place we noticed children with very poor posture. Very poor body posture was represented in 30% of monitored children. Neither child with higher BMI (overweight or obesity) had perfect posture. Only 10% of children with high BMI achieved good posture.

Conclusion: Children with overweight and obesity had postural disorders. None of the overweight or obese children had perfect posture. Already in school-age children it is necessary to observe posture and body weight, way of nutrition and physical movement.

Key words: Obesity. Posture. School children.



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The use of mechanotherapy, reflexotherapy and post-isometric relaxation in the process of rehabilitation of patients with ischemic disorder

The aim of the study is to examine the impact of additional physical therapy measures on the recovery of motor function, psycho-emotional state and self-care skills in patients after ischemic stroke.

Material and research methods: generalization and systematization of literary sources on this subject; monitoring of patients and examination of medical records; medical and biological methods: determining the amplitude of joint movements by means of goniometry, assessment of cognitive impairment using Mini-Mental State Examination (MMSE), manual muscle examination by the Lovett method, examination of daily motor activity using the Bartel index; methods of mathematical statistics.

An additional rehabilitation program for patients with ischemic stroke was tested in studies with two randomized patient groups: control (KG) and experimental (EG). KG became involved in the classic method of rehabilitation, which included:

physical therapy (morning hygienic gymnastics and individual training with a physiotherapist), physiotherapy (ozokeritoleki, electrophoresis), therapeutic massage, training with a speech therapist - defectologist and psychologist. EG rehabilitation was supplemented with mechanotherapy (training on a MOTOMed simulator), reflexology and postisometric relaxation.

After the rehabilitation intervention in patients in both groups, positive dynamics of the studied parameters was found. At the same time, the completed rehabilitation program in patients with CG compared to patients with CG significantly improved the functions of the musculoskeletal system (indicators of strength and amplitude of the muscles in the joints, $P < 0.05$) and self-care skills ($P < 0.05$), but almost not affected cognitive functions.

Key words: ischemic stroke, physical rehabilitation, movement, self-care, cognitive functions



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Changes in motor functions in children with cerebral palsy after the course of treatment by Professor Kozyavkin's Method: a single-blind study

Introduction: Modern intensive interventions addressing multiple challenges of children with Cerebral Palsy are attracting clinical and research attention. One of such methods is the Professor Kozyavkin Method (PKM).

Aim: The aim of the study was to assess changes in gross motor functions, muscle spasticity and passive range of motion (PROM) in children with spastic forms of Cerebral Palsy (CP) after the two-week treatment course.

Materials and methods: A single-arm, single-blind pre-post study was conducted on 57 children aged 4 to 12 years with spastic CP, admitted for treatment at the tertiary care center. Patients were evaluated before and after the two-week PKM treatment course, which included multiple interventions totally 4-5 hours of treatment daily. The Gross Motor Function Measure 66 (GMFM-66) tasks were video recorded and evaluated independently by two investigators. Passive range of motion (PROM) in the lower extremity joints was assessed with a manual goniometer, muscle spasticity – with the Modified Ashworth scale (MAS).

Results: GMFM scores after the PKM course increased statistically significant from 58.8 to 60.2 with a mean difference of 1.4 ± 2.9 points. Substantial improvement in PROM was noted in five of the eight measured joints; the most substantial improvement was observed in hip abduction – an average of 8 ± 5.8 degrees – and foot dorsiflexion – 8 ± 6.1 . Reduction of the muscle tone was observed in all measured muscle groups. Statistically significant decrease of spasticity was noted in hip flexors, with an average reduction of 0.25 scale steps (95% Confidence interval (95% CI) = 0.06 - 0.44), and hip adductors – 0.30 steps (95% CI = 0.08- 0.51).

Conclusion: Improvements of gross motor functions, increase of the PROM in the lower extremities and reduction of muscle spasticity have been detected after the two-week PKM treatment course.

Key words: Cerebral Palsy; Rehabilitation; Physical therapy; Muscle spasticity.



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Cross-cultural adaptation and validation of the Ukrainian version of the ABILHAND-Kids questionnaire

Introduction: Improvement of the manual ability is one of the most important problems of rehabilitation in children with cerebral palsy. There is a big amount of different diagnostic tools for assessment of the manual ability. However, its effectiveness is often studied on patients of only one population that has unique cultural peculiarities.

Aim: The aim of the study was translation, develop and cross-culturally validate the Ukrainian version of ABILHAND-Kids by testing its psychometric properties in a sample of Ukrainian children with cerebral palsy (CP).

Material and methods: The ABILHAND-Kids questionnaire was translated into Ukrainian language and cross-culturally adapted following guidelines. The Ukrainian ABILHAND-Kids was administered to 113 parents of children with CP. The psychometric properties of the Ukrainian version and its cross-cultural validation were investigated through the Rasch rating scale model.

Results: The result of the cultural adaptation and validation was developing the Ukrainian version of the ABILHAND-Kids

questionnaire with a high reliability ($R=0.95$). No significant floor (4%) and ceiling effects (5%) were observed. As a result of Rasch analysis, difficulty was defined for every item of the Ukrainian version of the questionnaire. One major misfit has been found for the item "Rolling up a sleeve of a sweater" that further was removed. The item "Putting on a backpack/school-bag" was split into gender-specific items, separately for girls and boys, as it was systematically easier for Ukrainian girls. All remaining items were saved, but the calibration was performed according to the defined difficulty.

Conclusions: The Ukrainian ABILHAND-Kids questionnaire has good psychometric properties for assessing manual ability in Ukrainian children with CP, holding the potential to be implemented in nationwide clinical practice.

Key words: cerebral palsy, rehabilitation, questionnaire, hand function.



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The use of shock wave in the treatment of enthesopathies

Introduction: Enthesopathies - i.e. the disease of tendon attachments arises as a result of repeated overloads and additive micro-injuries resulting in microstructural changes in the tissue of the tendon-ligament apparatus. Physical management is basic in the treatment of the disease.

Aim of the study: Assessment of the effectiveness of the use of shock wave in the treatment of enthesopathy. Material . 18 patients with calcaneal spurs and 16 patients with humerus epicondylitis.

Test method: Diagnosis was established on the basis of medical history, physical examination and ultrasound. The therapy used BTL-5000 SWT Power., Pressure 2.5 bar, frequency 10 Hz. In the case of epicondylitis, these were 4 applications, in the case of calcaneal spurs - 6. The severity of pain on the VAS scale, grip strength with a pressure gauge and distance of the

morning march to the onset of pain were assessed. Control examination including ultrasound after 6 weeks and 3 months after the first examination.

Results: After 6 weeks, pain subsided, on average from 8.2 to 4.1, improvement in grip strength by 30% on average, walking distance to pain increased by 70%, ultrasound examination reduced or resolved the symptoms of inflammation. In the follow-up examination, after 3 months, the results obtained were stabilized / ultrasound documentation attached.

Conclusions:

1. Enthesopathies are a difficult clinical problem.
2. Shock wave treatment should be the method of choice in the management of patients.

Key words: shock wave, enthesopathies, physical therapy.



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Facial nerve palsy-a case report

Introduction: The facial nerve often undergoes peripheral damages. One of the most common causes of this condition is viral infection, but there are many other diseases that can be the reason. The characteristic symptoms of facial nerve palsy are: abolition of mimic movements of the affected part of the face, mouth corner dropping, impairment of speech articulation.

Material and methods: A 52 year old female speech therapist noticed a weakening of the mimic movements of the left part of her face and loss of sensation in this area. Next symptoms were: left mouth corner dropping, impairment of speech articulation, Bell's syndrome, impairment of hearing, paresis of the tongue. Neurological treatment, physiotherapy and speech therapy exercises were implemented.

Results: After 6 weeks, the patient returned to work. She experiences a slight asymmetry of the lips. The woman feels numbness in the left part of the face in situations of stress or fatigue.

Conclusions:

1. In the case of facial nerve palsy, it is very important to start rehabilitation as soon as possible.
2. The effectiveness of VII nerve palsy treatment depends on the close cooperation of specialists.
3. Patient involvement is very important in the treatment of facial nerve palsy.

Key words: the facial nerve, peripheral damage, rehabilitation



Kuźdżał Adrian

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Screening and treatment of pain and dysfunction of the cervico-maxillofacial region in the physiotherapy – according to international OMPT standards

In everyday practice of physiotherapy of the cervical spine, patients with craniofacial or temporomandibular joint problems are often found. Neuroanatomical and biomechanical relationships and connections, as well as epidemiological data from clinical trials indicate frequent co-occurrence of pain and dysfunction of the upper cervical spine with pain and cranio-mandibular problems. The cranio-mandibular area

is an important part of the cervico-maxillo-facial chain. The workshop concerns the standard of screening examination and the principles of patient therapy with pain and dysfunctions in this area in the physiotherapy. The proposition of diagnostic and therapeutic algorithm for cervical-maxillofacial pain will be discussed.



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Rehabilitation of patients with multiple sclerosis, experiences of the Rzeszów school

History of rehabilitation of patients with multiple sclerosis does not go far back in time, not only in Poland. The lenient approach to neurological rehabilitation in general was caused by unjustified ideas about the lack of brain plasticity. Moreover, it was commonly assumed that physical activity was not recommended for patients with MS. They were encouraged to avoid strain, to relax and to give up active lifestyles; consequently, no rehabilitation was offered to this large group of patients with a typical neurological disorder. However, even in the early 1970s Magierowski and Cendrowski recommended breathing exercise, stretching, resistance and endurance training as well as coordination and balance exercise to patients with multiple sclerosis.

The first rehabilitation ward launched in the Rzeszów Region in 1985 introduced various types of rehabilitation for patients with MS. An MS Club was established in Rzeszów, and the first rehabilitation camp designed for patients with multiple sclerosis was organised in Solina in 1987. The experiences gained were reported in numerous studies focusing on rehabilitation designed for this group of patients.

Furthermore, the first Nationwide Academic Conference en-

titled "Rehabilitation in Multiple Sclerosis" was held in 1987. Professor Wiktor Dega, who was unable to attend, wrote to the organisers of the Conference: "I am truly grateful for the invitation for the Rehabilitation in Multiple Sclerosis Conference. I do not have to assure you how happy I would be to take part in it, as a mark of appreciation for the organizers, and because of the subject matter which finally got its turn. Congratulations on the idea and the fact it has been realised". Rehabilitation applied to patients with MS follows the classic guidelines of the Polish School in Rehabilitation, which means that interventions are applied early, even during attacks of the disorder; they are administered in a complex manner by a rehabilitation team to all patients, and they include a variety of novel forms of home-based rehabilitation.

In 2004, the 5th International Congress of the Polish Rehabilitation Society in Rzeszów adopted "Principles for rehabilitation in multiple sclerosis" which constitute guidelines for the proceeding, recommended by the Society.

Key words: multiple sclerosis, rehabilitation, guidelines, MS club, rehabilitation program, complexity.



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Effect of rehabilitation on the performance status of patients with lung cancer during chemotherapy

Introduction: The performance status is the patient's ability to perform everyday activities and independent functioning.

Aim: The overall aim of the study was to assess the impact of motor and respiratory rehabilitation on the change in the performance status of patients with lung cancer staying at the clinic of clinical oncology during chemotherapy.

Material and methods: The group of patients qualified for the study were patients staying at the Clinic of Clinical Oncology of the Subcarpathian Center of Oncology treated with chemotherapy for lung cancer. Patients received 3-day chemotherapy at intervals of 21 days. The performance status was assessed according to Karnofsky scale, 6 Minute Walk Test along with a subjective assessment in the Borg scale.

Results: 47 patients participated in the study. The study group included 16 women and 31 men. The patients were aged from 44 to 78 years. The average age of the patients was 65 years. The tumor stage II was assessed in 15 patients, III in 21 patients, and IV in 11 patients. The largest group were patients with a

performance status of 80 according to the Karnofsky scale. A group of patients with localized cancer in the left lung prevailed. A partial response was obtained in 24 patients.

Conclusions: It was found that age <65 years, lower stage of cancer and stabilization in response to treatment have an impact on higher performance status assessment according to Karnofsky scale. It has been shown that age <65 years, stabilization in response to treatment and higher score on the Karnofsky scale affect the higher assessment of performance status according to 6MWT. The higher stage of the cancer, the progression in response to treatment and the lower Karnofsky score influence the higher subjective assessment of fatigue and dyspnea according to the Borg scale. It has been found that weight loss before treatment and during treatment affects of performance status measured by 6MWT for men and patients <65 yrs.

Key words: performance status, 6MWT, lung cancer, chemotherapy



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Overweight and obesity versus functional performance in patients with stroke – effects of rehabilitation

Purpose: Assessment of effectiveness of in-patient rehabilitation in individuals with stroke, taking into account functional performance and body mass index (BMI).

Material and methods: The examinations were conducted three times in the Rehabilitation Clinic with Early Neurological Rehabilitation Unit at the Regional Hospital No. 2 in Rzeszów. Based on the inclusion and exclusion criteria, the first examination took into account 128 patients, the second examination involved 114 and the third exam 100 subjects with stroke. Body weight was measured with an accuracy of 0.1 kg, using body mass composition analyzer Tanita MC – 780 MA. Body mass index (BMI) was calculated for all the subjects. Effects of rehabilitation were assessed with Barthel Index and Ashworth scale. The study was approved by the Bioethics Commission.

Results: Higher functional efficiency in daily life, measured

with Barthel Index, was observed in patients with normal body weight, compared to the overweight and obese subjects (Exams I, II and III). The findings show that, prior to the rehabilitation, the overweight patients had far higher scores in the assessment of upper limbs based on Ashworth scale (mean = 0.35 ± 0.54) compared to the obese patients (mean = 0.03 ± 0.32) and the patients with normal body weight (mean = 0.24 ± 0.75).

Conclusions: Following the rehabilitation at hospital the patients with normal body weight achieved higher functional efficiency. The study showed beneficial effects of rehabilitation in BMI. The positive effects of the rehabilitation were sustained for three months (exam III), possibly contributing to decreased risk of stroke recurrence.

Key words: overweight, obesity, stroke, rehabilitation, Barthel Index, BMI



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Comprehensive rehabilitation of children with the dyskinetic form of cerebral palsy

Introduction: The dyskinetic form of Cerebral Palsy is characterized by an abnormal posture and / or movement pattern and involuntary, uncontrolled, stereotypical, repetitive movements. Dyskinetic features may coexist with symptoms of spastic, most common form of MPD, speech disorders, concentration disorders or other accompanying irregularities. Due to the selection of the appropriate therapeutic agent, an appropriate patient assessment is recommended.

Methods: Assessment of movement disorders in children MD-CRS is a clinical measurement tool used in developmental age. It allows to determine the presence, severity and type of movement disorders in seven different areas of the body: eye and eye socket, face, tongue and mouth, neck, torso, upper

limb and lower limb. Evaluates the impact of movement disorders on everyday functions and activities.

Results: The information obtained after the MD-CRS scale, supplemented with a rehabilitation study, is the basis for determining the goal of treatment based on ICF-CY guidelines, selection of therapeutic team members and methods of therapeutic treatment.

Conclusions: Accurate clinical diagnosis, properly set goals and cooperation of therapeutic team members condition effective treatment of patients with the dyskinetic form of cerebral palsy.

Key words: Dyskinesia in CP, MD-CRS scale, comprehensive rehabilitation.

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Loss of forward gaze. An underestimated impairment of quality of life in patients with ankylosing spondylitis. State-of-the-art surgical correction

Progressive kyphosis of cervical spine as seen in ankylosing spondylitis and remaining spondylitic arthropaties can lead to a chin-on-chest deformity where the chin rests against the sternum with resultant loss of forward gaze, disturbed oral feeding and swallowing, and problems with hygiene of the neck. Some patients with this deformity may develop cervical myelopathy as an effect of drapping the spinal cord over the posterior vertebral bodies. This is a debilitating condition which severely impaires quality of life with inability to see objects, namely faces of people, at the level of a patient's eyes while standing; to perform deskwork tasks, namely reading documents, handwriting, and operating a computer from a sitting position. Other everyday life activities like cooking or driving a car may also be limited. Oral feeding might be severely compromised due to decreased range of mouth opening produced by blockage of the jaw by the sternum, and problems with swallowing. Drinking is impossible unless a patient uses a straw. The hygiene of the neck including shaving in man might be very difficult or even impossible. The same refers to mouth hygiene and dental treatment.

The only measure to help these patients is surgical correction of cervical kyphosis. Briefly this correction includes osteotomy and realignment of the cervical spine. This is a major and very demanding procedure which should be reserved only very experienced spine surgeons or dedicated reference centers specialized in this type of surgery. Even so cervical osteotomy carries extremely high rate of complication including injury of spinal cord with resultant tetraparesis. We propose our novel osteotomy which we believe decreases the above mentioned risks. Currently cervicothoracic C7 and T1 pedicle subtraction osteotomies (C/T PSO) are the most used surgical techniques in correction of chin-on-chest deformity in ankylosing spondylitis (AS). Their alternative is the cervico-thoracic extension osteoclasia (C/T EO). The latter involves osteotomy of posterior elements followed by osteocla-

sis of the ankylosed cervico-thoracic intervertebral disk with opening osteotomy anteriorly through head extension. The osteoclasia is poorly controlled and as such may carry well documented risk of unintended dislocation of cervical spine with consequent neurological injuries. To eliminate this risk we propose modification of C/T EO by replacing osteoclasia with crosswise cut of C7 vertebral body which we call C7 extension crosswise osteotomy (C7 ECO). Crosswise cut also eliminates risks and disadvantages of C/T PSO where posteriorly based wedge excision may lead to: (i) stretching injury to lower cervical nerve roots, (ii) failure to achieve the exact angle of excision and therefore sagittal correction through closure of osteotomy. In contrast, opening osteotomy anteriorly as in our method instead of closing it posteriorly as in PSO eliminates risks related to shortening of the posterior column: (i) buckling dura, (ii) kinking the spinal cord, and (iii) stretching lower cervical nerve roots within newly neuroforamen. Also we present our method of calculating the angle of correction. We used the following data to calculate the value of postoperative CBVA: (i) trajectory of normal (natural) vision line: 15 degrees downward inclination relative to the Frankfort line (Fig. 3), (ii) the vertical range of near peripheral visual field: 60 degrees that is 30 degrees above and 30 degrees below the normal vision line (Fig. 4B), and (iii) maximum eye elevation 27 degrees, while maximum eye depression 45 degrees (Fig. 4A and C). Calculations were based on regular side photographs of the patient standing in the neutral posture and sitting at the desk. Simulation showed that postoperative 25 degree CBVA would provide the forward gaze as expected by the patient before surgery (Fig. 4). Calculations of CBVA can be carried with the use of whole spine X-rays including the skull and Surgimap software.

The C7 ECO seems a viable alternative to C/T EO and C/T PSO for correction of fixed chin-on-chest deformity and cervical kyphosis.



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Modern use of physiotherapy in treating shoulder impingement syndrome on the basis of evidenced based medicine

During the workshops functional evaluation of a shoulder joint and analysis of movement patterns disorders of a shoulder girdle will be presented. The treatment will be planned according to hypothesis based on ICF assessment. In the treatment various movement tasks in different starting positions and conditions will be used to achieve the highest possible

activity level of the patient. Improvement of upper extremity will be based on stimulation of proprioceptors with a use of proper grips. Improvement of scapulohumeral rhythm will be the base for recovery of a normal movement pattern. Stimulation of body structures and functions will take place during a goal oriented task performed by the patient.



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Limitations in physiotherapeutic procedures in patients with cancer

Introduction: The incidence of various types of malignancies in Poland increases every year. Rehabilitation of cancer patients is becoming a new challenge in medicine. It is necessary to standardize the rehabilitation programs for patients with cancer and to create an organizational system for the rehabilitation of patients with cancer, including physiotherapeutic procedures.

Aim of the study: The author of the work presents a new view on medical rehabilitation of cancer patients and indicates some limitations in physiotherapeutic procedures.

Material and method: Review of current Polish and foreign publications and own experience showing new trends in the rehabilitation of patients during cancer.

Results: Despite the small number of publications, both Polish and foreign, presenting the possibilities of using rehabilitation in the management of patients with concomitant oncological history, there are more and more reports on the development

of various techniques and methods that we can successfully use in these patients.

Despite the lack of unambiguous procedures for dealing with patients with cancer, we have an increasingly wide range of possibilities to use new techniques of comprehensive rehabilitation. The therapeutic process requires the cooperation of a team consisting of a specialist in medical rehabilitation, a physiotherapist and a clinical oncologist.

Conclusions:

1. It is necessary to start multicentre research on the use of physiotherapeutic techniques and methods in patients with cancer based on EBM principles.
2. Patients with cancer who undergo comprehensive rehabilitation should be under the constant care of a specialist in medical rehabilitation and an oncologist in order to evaluate the rehabilitation program and monitor cancer.



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Comparison of the effectiveness of shockwave therapy with selected physical procedures in patients with tennis elbow syndrome

Introduction: The tennis elbow syndrome is soft tissues pain syndrome of the lateral epicondyle of the humerus. The study aimed to compare the effectiveness of radial shock wave therapy (RSWT) with laser and ultrasound therapy in the study group.

Material and methods: 77 patients subjected to radial shock wave therapy (RSWT, group 1 - 40 people) vs laser and ultrasound (group 2 - 37 people) were surveyed. The effects of therapy were measured with Mill and Thomson functional tests, EQ-5D-5L general health questionnaire and specific Patient - Rated Tennis Elbow Evaluation (PRTEE) for functional assessment of patients with "tennis elbow syndrome".

Results: A statistically significant improvement was observed in both groups in Thomson and Mill test. The treatment effects were statistically significantly different between groups when measured with Mill test ($p = 0.006$). The effects of therapy measured on the PRTEE scale were statistically significantly different in both groups in each category ($p < 0.001$) in favor of the RSWT group. In EQ-5D-5L scale, statistically significant improvement was observed in the RSWT group only in the self-care domain ($p = 0.024$).

Conclusions: 1. A greater effect of therapy was observed in patients with tennis elbow syndrome treated with RSWT.

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Association between bone turnover markers and leptin in girls with adolescent idiopathic scoliosis

Introduction: The link between scoliotic deformity and bone metabolism in adolescent idiopathic scoliosis (AIS) has not been well researched. Moreover, the data concerning the cross-talk between leptin level and bone markers in this group of patients are lacking.

The aim: The objective of this study was to correlate the extent of scoliotic-curve severity with the bone turnover and leptin level in girls with AIS.

Material and methods: The study encompassed 77 AIS girls, aged 14.7 ± 2.17 years. Scoliotic curve severity assessed by Cobb's angle was categorized as mild (10-19°) moderate (20-39°) or severe ($\geq 40^\circ$). Corrected height, weight, waist and hip circumferences were measured and body mass index (BMI), corrected height Z-score, BMI Z-score and waist/height ratio (WHtR) and were calculated for the entire group. Body composition parameters: fat mass (FAT), fat-free mass (FFM) and predicted muscle mass (PMM) were determined using a bio-electrical impedance analyzer. Bone turnover markers (osteocalcin (OC) and amino terminal of collagen cross-links NTx) and leptin levels were assessed in serum.

Results: Multiple regression analysis showed that, OC, NTx

(negatively with $p < 0.05$) and leptin (positively with $p < 0.01$) were significantly associated with curve severity in AIS girls. Moreover, Cobb's angle was positively correlated with W/HtR ($p < 0.01$) and FAT ($p < 0.05$). One-way analysis of variance (ANOVA) revealed significant differences in leptin ($p < 0.05$ vs. mild only), OC ($p < 0.05$ vs. mild and moderate) and W/HtR ($p < 0.01$ and $p < 0.05$ vs. mild and moderate respectively) between the three scoliotic severity subgroups. OC was significantly lower in the severe AIS subgroup, while leptin and W/HtR were significantly higher. Leptin level correlated also significantly with BMI z score ($p < 0.001$), W/HtR ($p < 0.0001$) and body composition parameters ($p < 0.000001$). Moreover, there was a significant negative correlation between NTx and leptin level ($p < 0.05$).

Conclusions: Bone metabolism in AIS girls seems to be altered and significantly related to the scoliotic curve severity. Leptin may be a crucial link in the cross-talk between bone turnover and body composition in this group of patients.

Key words: adolescent idiopathic scoliosis; bone turnover markers; leptin; waist to height ratio



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The use of stochastic resonance in the rehabilitation of a child with cerebral palsy – case study

Introduction: The aim of the study was to assess the impact of stochastic resonance therapy on the development of gross motor skills, normalization of muscle tonus, body quality and body posture in a child with CP.

Material and methods: In stochastic resonance therapy took part a 6-year-old boy diagnosed with cerebral palsy - spastic diplegia. The trainings took place 3 times a week for 3 months at the Children's Rehabilitation Center Maz - Med in Rzeszów. Gross motor was assessed using the GMFM - 66 scale and muscle tonus using the modified Ashworth scale. Two tests were performed: before and after SRT - Zeptoring therapy.

Results: After SRT - Zeptoring therapy on the GMFM scale, the sum of points in all trials evaluating gross motor, increased from 82 to 114 points, while the percentage sum of points in all trials increased from 56 to 71 percent. On the modified

Ashworth scale there was a change to the lower grade in the examined joints (except for the wrist joint).

Conclusions:

1. Stochastic resonance therapy affected on the improvement of gross motor skills, the quality of gait, body posture and there was a normalization of a child's muscle tonus.
2. In order to increase the effectiveness of the process of comprehensive rehabilitation of children with cerebral palsy, it would be advisable to supplement rehabilitation with regular and individually adapted to the child stochastic resonance therapy.
3. Scientific research should be conducted on the impact of stochastic resonance on children due to the large deficit of such work.

Key words: stochastic resonance, cerebral palsy, rehabilitation



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Effect of hydrokinesiotherapy on children of 10-13 years with scoliotic posture

Introduction. Postural disorders is one of the orthopedic pathologies most commonly seen in children and teens, and is 90% of all abnormalities of the musculoskeletal system. This means that every fourth child in Ukraine has a postural disorder, and 5-6 people in a thousand have scoliosis. In students aged 10 to 15 years, postural disorders is found in 94% of cases (Altunin, 2017). Swimming is one of the few forms of exercise in sports and physical therapy that promotes the harmonious and holistic development of the body with minimal risk of injury (Radzimińska et al., 2013). Movement in the aquatic environment has a number of health benefits, including oxygenation and immunity enhancement, increased endurance, and improved circulatory and respiratory function (Pasek et al., 2009). By balancing gravity and maintaining body weight, the aquatic environment forces the muscles to relax, making it easier to take the right posture (Barczyk et al. 2005).

Materials and methods. In this study take part six participants (age 11.5 ± 1.38 years) with different physical data. This number of participants was selected in order to reduce the occurrence of statistical errors of type 1 and 2 power.t.test ($n = 6$, $\delta = 1$, $sd = 1$, $sig.level = 0.05$, $power = 0.3471565$, $alternative = two.sided$). 6 children perform the same corrective exercises in the pool for four weeks, three times a week.

Statistical analysis. Data were analyzed using the Wilcoxon

signed-rank test. Differences before and after the course of hydrokinesiotherapy for each participant. Statistical significance level $p < 0.05$.

Result. The difference between acromial points, finger points, iliac-crest points, Moshkov's rhombus, lower scapular corners on the left and right before and after hydrokinesiotherapy. Significance level (α) = 0.05. Acromial points, because the value of $P = 0.03351$ is less than the level of significance. Finger points because $P = 0.03401$ is less than significance. Hip crest points because $P = 0.25$ is greater than the significance level. 3 participants were rated for this test because the other 3 had no deviations. Rhombus Moshkova, because the value of $P = 0.03501$ is less than the level of significance. Lower corners of the scapula, because the value of $P = 0.03351$ is less than the significance level.

Conclusion. Our study demonstrated that hydrokinesiotherapy has a positive effect on posture. But two participants had hip joint dysplasia, and one of the indicators was the height of the iliac-crest points, which had not been sufficiently affected by therapy. The results of the study are better for participants of 10-11 years than 12-13 years, so we can assume that the sooner intervention begins, the better result will be.

Key words: hydrokinesiotherapy, scoliotic posture, posture disorders.



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Dysphagia treatment from speech-pathologist and Physiotherapist aspect

Introduction: Dysphagia, swallowing disorder, is a medical complication occurring in clinics of neurology, otorhinolaryngology, intern clinics etc. In the context of a current study we focus on neurogenic oropharyngeal dysphagia in patients after stroke.

Material and method: We detected the incidence of swallowing disorders at ICU of neurology clinic in a defined period of time, and rehabilitation options of patients from speech-pathologist and physiotherapist aspect. The very core of the study was selection and brief description of therapeutic techniques used for swallowing disorders within a multidisciplinary approach. Many studies are pointing at positive effect of Shaker manoeuvre and its modification (especially CTAR, JOAR)

mainly in acute phase after ischemic brain strokes, therefore we this part was given most of our attention. Building of good posture, especially in C and Th spine, breathing exercises and orofacial stimulation are also important part of complex treatment.

Conclusion: In many cases this is a medical state that can be fully or at least partially rehabilitated under the condition of full patient cooperation, intensive and properly targeted intervention, which is why it is important to provide patients the necessary care.

Key words: neurogene oropharyngeal dysphagia, multidisciplinary approach, aspiration, aspiration pneumonia, compensation, rehabilitation



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Assessment of the arching of foot load in physiotherapy students

Introduction: The aim of the study was to assess the state of arching of the feet of students with varied body structures.

Materials and Methods: 106 students (33 men and 73 women) participated in the research. The average age of probands was 22.28 years. The CQ-ST Podoscope was used as the main research tool. The following parameters were monitored on the foot: Chippaux - Šmiřák index to evaluate the quality of the longitudinal arch of the foot, for the transverse arch of the Weisflog index and to evaluate the occurrence of deformities of the toes: thumb angle (ALFA) and little finger (BETA). Basic somatic features, i.e. body height and weight, were tested, and the BMI index was calculated using the Tanita BC - 601 weight. The data were analysed using basic statistical characteristics, Student's t-test, and Pearson's linear correlation coefficient.

Results and discussion: Most students are characterized by

a physiological arched longitudinal arch of the foot. On the basis of Weisflog index the number of correct feet, laterally and transversely flat was compared in the people with normal weight and overweight. The people with normal body mass had mostly transverse correct feet. Overweight people in almost half of the cases had transverse flat foot. In the studied group of university students, the occurrence of thumb deformities was found mainly in women.

Conclusions: The research results point to the most significant differences between the parameters of the arch of the foot and the sex. In women, hallux valgus occurs as a frequent deformity due to poor and narrow footwear, and in men, the lower transverse arch of the foot due to higher weight.

Key words: Students. Foot arches. Chippaux - Šiřák index. Weisflog index, body mass,



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An assessment of the effectiveness of Vojta therapy for premature babies

Introduction: The premature babies are among those symptomatically at risk in terms of the development of the infantile cerebral palsy. The reflex locomotion therapy by Vojta suppresses the abnormal locomotion patterns and facilitates the genetically programmed locomotion programme. The aim of the research was assessment of Vojta therapy effectiveness for premature babies.

Materials and Methods: The presented study included one hundred and twenty premature babies, divided into groups according to their birth weight and their age at the beginning of the therapy. All patients were rehabilitated with Vojta method during the first year of life. The monitoring took place of a health centre Prešov in Slovakia. The quantity of the global patterns was monitored in the retrospective study of infants under the first year of age. The infants with a pathological development were assessed using the locomotion stages ac-

ording to Vojta. The quality of straightening up was assessed every two months through the calculation of the retardation quotient.

Results and discussion: The results of the research statistically confirm the positive effect of early physiotherapy on the quality of the postural abilities. The risk of development of the infantile cerebral palsy rises with the decreasing birth weight. The premature babies activated by the reflexive therapy by the first trimenon achieved a higher level of locomotion in the twelfth month.

Conclusions: It has been noticed that the Vojta therapy showed beneficial effects on motor development outcomes for premature babies.

Key words: extreme prematurity, motoric development, Reflex locomotion therapy by Vojta.



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The influence of normocapnic hyperpnea training on the level of exercise tolerance in patients with lung cancer

Introduction: The aims of the research were the evaluation of the given therapy on the 6MWT and the analysis of the dependence between breathing parameters and 6MWT.

Material and methods: 104 patients took part in the research. In the study group, 52 patients received SpiroTiger training, whereas the control group including 52 patients performed standard breathing exercises. 6MWT was used to analyze the effectiveness of the therapy.

Conclusions: Extended distances in the study group could be seen in 6MWT ($p < 0,05$). In both groups, the distance in 6MWT was extended thanks to the improvement in breathing parameters (FVC, FEV₁). Analysing the effectiveness of SpiroTiger, it is advisable to continue the research on the larger group of patients suffering from lung cancer.

Key words: NHT, SpiroTiger, lung cancer



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Assessment of the efficiency of the technique of continuous passive movement after knee arthroscopy

Rehabilitation of patients with knee joint pathology (KJ) is a very topical problem in our country, after surgical interventions in the period of treatment such a morbidity for restoring certain anatomical structures, but do not completely eliminate their functional inferiority (there is a limitation of joints movement, muscle weakness, develops or progresses the scar and adhesion process, the phenomenon of local osteoporosis, etc.), which is in turn requires a long-term regenerative treatment.

Aim: to evaluate the effectiveness of physical rehabilitation of patients with knee joint pathology in the postoperative period using the method of continuous passive motion in joints using domestic apparatus.

Material and methods: a comparative analysis of the results of rehabilitation of 2 clinical groups of patients, which were identical in terms of sex, age, type of pathology and type of surgical interventions (52 males and 37 females), aged 18 to 60 years old with pathology, who were inpatient treatment, were performed. In the postoperative period, patients in the 2nd group, in addition to standard rehabilitation measures,

performed passive development of movements in the affected with the help of domestic devices for the automatic development of movements.

Results: developed a program of physical rehabilitation of patients with pathology, which consists of several stages, based on the comprehensive application of a wide range of rehabilitation means with an individual approach to the course of the postoperative period in each individual patient.

Conclusions: The results of clinical and instrumental research methods show that the method of continuous passive movement with the use of a domestic device for the automatic development of movements in the process of physical rehabilitation of patients with pathology of the knee joints after arthroscopy, significantly leads to a reduction in the timing of rehabilitation in the joints in the joints 7% in the immediate postoperative period (up to 3 weeks after surgery) and reduction of pain syndrome by 14% (on YOUR scale), compared with the control group.

Key words: knee joints, arthroscopy, continuous passive motion.

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Features of food behavior and nutritional deficiencies among schoolchildren in 1–4 grades

Aim: Assessment of nutritional status in schoolchildren of the primary school, the determination of the prevalence of malnutrition, deficiencies of nutrients, vitamins, macro - and microelements in children of 7-11 years.

Materials and methods: Assessment of nutritional status of 120 children of 7-11 years. Through the survey, we identified the characteristic features of food behaviour in schools. After that, the 3-day diet (two weekdays and one weekend) has been thoroughly identified by using food diaries. All food products, their composition and the quantity consumed throughout the days of observation were recorded in the diaries. The amount of consumed food was determined with the help of special electronic scales for weighing food. The nutritional value of the diet was calculated by using a special computer program Dietplan 7 (UK).

The following indicators were calculated and included in the analysis: daily caloric intake, amount of consumed proteins, fats, carbohydrates, macronutrients (calcium, phosphorus, potassium, sodium, chlorine and magnesium), essential trace elements (iron, zinc, iodine, fluorine, copper, selenium, chromium, molybdenum, cobalt and manganese), vitamins A, D, E, H, C, group B, etc. The obtained results were compared with the daily rate (increased, reduced or normal intake) for each macro- or micronutrient with age, sex, physical activity and other features of children in comparison to the reference values of consumption of nutrients and calorie food recommended by the Committee on Medical Aspects of Food and Nutrition Policy (1991)

Results: The modern diet of primary school pupils in general is unbalanced, which creates the risk of physical development disorders and deficient states. Adequate daily protein intake was observed only in 28.6% of children, in 40.7% it was excessive, in 30.8% - reduced. The decrease in fat intake was observed in 45.1% of pupils, which was accompanied by

a significant increase in the consumption of carbohydrates. Calorie intake appropriate for the age was observed only in 15.4% of students, in 51.6%, it was increased, the remaining pupils – inadequate. Increased consumption of saturated fatty acids was at 68.1% of children, lack of consumption of mono - and polyunsaturated fatty acids at 54.9% and 74.7% of schoolchildren, respectively. Increased daily intake of cholesterol was observed in 63.7% of children. Significant deficiencies in the consumption of micro - and macronutrients in the diet of children were identified during the study. Calcium deficiency was reported in 73.6% of students, magnesium in 82.4%, iron in 65.9%, zinc in 49.5%, selenium in 76.9, iodine in 90.1% of schoolchildren. In addition, we identified a significant deficiency in the consumption of vitamins by schoolchildren. Retinol consumption deficiency was recorded in 84.6% of students, carotene in 57.1%, vitamin D in 97.8%, vitamin E in 95.6%, thiamine in 7.7%, riboflavin 40.7%, niacin 39.6%, vitamin B6 35.2%, vitamin B12 9.9%, folate 58.2%, biotin 92.3%, vitamin C 72.5% children.

It should be noted that the formation of deficits in schoolchildren is quite diverse and requires an individual approach to correcting the child's nutrition, in some cases consultations with a nutritionist and using a number of dietary supplements is also required.

Conclusion: The modern diet of children in Ukraine is unbalanced. It provides excessive amounts of energy, carbohydrates, proteins with simultaneous deficiency of fats, polyunsaturated fatty acids, micro- and macro elements, vitamins. This situation can affect the health of children, their physical and intellectual development, might create problems with the assimilation of the school curriculum, and may lead to various deficiencies.

Key words: children, nutrition, minerals, diet, nutritional deficiencies



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The influence of physical effort on static standing balance

Introduction: Balance, stable body posture and their control is a very important factor affecting various manifestations of human motor activity and a necessary condition for the implementation of free movements and locomotion. The aim of the study was to assess the relationship between muscle fatigue as a result of interval exercise and the size of selected static balance parameters.

Material and methods: The study group consisted of 30 people aged 19 to 22 years. The International Physical Activity Questionnaire (IPAQ) extended with authors' questions and the Cosmogamma stabilographic platform, on which an balance pad (AIREX) was placed were used. The questions in the questionnaire concerned the level of physical activity during the last week. Static balance was assessed before and after interval training in two trials, eyes open and closed. In addition, three heart rate measurements were made before,

during and after exercises.

Results: In the majority of the examined patients observed an increase in the maximum swing of the center of gravity in the X axis and Y axis after physical effort. There was also a slight increase in the average swing of the center of gravity in both axes. The values of lateral and anterior posterior tilts after physical effort increased in the test with the eyes closed, while in the test with the eyes open decreased. The length of the center of gravity path in the subjects after intense training increased significantly in the test with the eyes closed compared to the test with the eyes opened.

Conclusions: Stability measurements allow to detect changes in the parameters of balance and postural stability resulting from muscle fatigue as a result of specific physical training.

Key words: balance, muscle fatigue, physical effort, stabilometric platform



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The changes of the muscles tension and their meaning for coordinated movement parts of the human body

Abstract: The coordination movement is quite folded question, the most often considered as one from the motor abilities of the human body. The human every motion activity should be coordinated, smooth, exact, purposeful, perfection executed. We see however the disorders of the co-ordination of the movement at e.g. neurological patients and also orthopedic and different. Does the improvement of the co-ordination of the movement depend on the possibility of the regeneration of the nervous arrangement exclusively? If was it in fact so if our physiotherapeutic work would have the sense? We observe and can measure the effects of the patients functional improvement. We seek and apply the most effective methods of the work with patient. The aim of the work was the analysis of the influence of central stability on the parameters of the coordinated movement of the trunk and lower limbs. The material: 55 persons studied, 33 after the stroke of the brain (16 persons the stroke of the cerebellum) and 22 person with the degenerative disease of the spine in the lumbar section. Lids studied, average - 58 years; in the undercut and chronic peri-

od of the disease. The patients were asked for the realization in two order of various motive tasks: in the sitting position, the dynamic passage from the bend to sits in the position and the march in the place with high raising knees. It the measurements of described activities was led in conditions without and assuring the stability of the body, with active strained muscles. We were measured inclination of the trunk in the front and arrow plane of the movement and the time of the march and the height of raising feet over basis. The tension of muscles stabilise the trunk deeply was also analyses (m. multifidus and m. transverse abdominis) and the muscle supraspinatus on the occupied directly side at patients after the stroke and at random at patients with the team the pain spine. The statistical analysis showed essential differences in studied ill groups in dependence on that were the tasks realized with the emphasis of central stability or also not. **Key words:** central stability, motor co-ordination, the tension of muscles, the movement of the trunk in the front plane, the movement of the trunk in the arrow plane, march in the place.



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The coordination movement of upper limb in the active and passive conditions of trunk stabilisation

Introduction: The motor coordination is ability to executing folded movements: exactly, quickly and in changing conditions. The stability of the part of the human body is the essential element for the possibility of the realization of the movement. It is the special fix point for that part of the human body during the executed movement in space.

Aim: The aim of the work is the analysis of dependence between the muscles tension and chosen parameters of the motor coordination of wrist and human palm and the local stability or its lack.

Material and methods: 66 persons study (with back pain and the stroke of the brain). Age of studied: 20-80 years old, the women and men. To the investigation of the parameters of the co-ordination movement (the range of movement, speed/ frequency of the movement, the strength of the flex of the palm)

were used Hand Tutor device and hand dynamometer. The patients were examined in two exit positions: sitting without the support and lying with the stability of the trunk and the tested upper limb. It was also estimated the tension of muscles: multifidous, transverse abdominis and supraspinatus.

Results: the conditions of the trunk and upper limb stabilisation caused essential change of the parameters of the coordination movement of the palm fingers and the wrist. In the essential and interesting way the tension of analysed muscles was also changed .

Conclusions: Local stability influences on the improvement of the co-ordination movements in the radio - carpal joint and the human palm.

Key words: stability, muscles tension, motor coordination, the range of the movement, speed/frequency, grip hand.



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Usage of the innovative rehabilitation procedures in the treatment of peripheral cerebral palsy of facial nerve

Aim: The aim of this study is pointing out the importance of application the innovative rehabilitation procedures in patients with peripheral cerebral palsy of facial nerve.

Characteristics of the research: Tested group is consisted of 19 patients with a verified diagnosis of peripheral cerebral palsy, for various reasons. The ratio of men and women is 7:12 with average age 42 years. Patients are sent from neurologic clinic of the L. Pasteur University Hospital in Košice, treated at the FBLR (Physiatry balneology and medical rehabilitation) UPJŠ (university) and UNLP (hospital) clinic in Košice since December 2017, while the treatment is still ongoing.

Material and methods: In the research part of the work, we use method of qualitative research. During complex rehabilitation care for the treatment of orofacial disorders within kinesiotherapy, we apply on patients suffering by peripheral cerebral palsy of facial nerve - stimulation techniques, with the usage of developmental kinesiology elements. For the facilitation of

mimical muscles, we use kineziotaping. Within the Electrotherapy, we serve electrostimulation to patients who do not move. From the phototherapy, we use laser for its biostimulation effects and regenerative properties. We continuously evaluate the functional condition of the motoric functions by the usbCortanamiesta muscle test according to Janda.

Results: With innovative rehabilitation procedures, in the patients monitored after multiple years of therapy, we managed to positively influence their functional status, with a partial improvement in motoric responses in the mentioned area.

Conclusion: The main task of the study is, in the examined sample of patients with peripheral cerebral palsy of facial nerve, pointing out the importance of these treatment procedures and their targeted usage in complex treatment in patients with this diagnosis.

Key words: peripheral cerebral palsy of facial nerve, rehabilitation procedures.



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A systematic review of reports on the rehabilitation of persons with Multiple Sclerosis

Introduction: Difficulties arising during the rehabilitation of persons with multiple sclerosis (MS) result not only from the unpredictability of the course of the disease, but mainly from psychological and socio-economic implications. The first symptoms usually appear between the ages of 20 and 40, i.e. in the so-called productive and reproductive age, also creating problems related to procreation.

Material and methods: In the review lecture a systematic review of reports on the rehabilitation of persons with MS will be presented.

Results: Over the past six years, there have been hundreds of reports on rehabilitation in multiple sclerosis, systematic reviews and meta-analyses which deserve special attention of such authors as Khan and Amatya [2017], Campbell et al. [2016], Dalgas et al. [2015], Kantele et al. [2015], Amatya et al. [2015, update in 2019], Lamers et al. [2016], Martin-Valero et

al. [2014], Pearson et al. [2015], Rietberg et al. [2017], Abboud et al. [2017], Edwards and Pilutti [2017], Casuso-Holgado et al. [2018]. The recommendations of the American Academy of Neurology - AAN - have also been regularly updated.

Conclusions: There are no explicit recommendations, diagrams nor guidelines for rehabilitation in MS. Despite the increasing availability of modern rehabilitation methods, there is still a lack of high quality evidence for individual methods. Further research is needed to determine the effectiveness of various improvement methods, with the appropriate study design, precise outcome measures, evaluation of individual types and intensity of modality, and the cost-effectiveness of these interventions.

Key words: Multiple sclerosis, MS, rehabilitation, systematic review.



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Burden and quality of life of people caring for patients with Multiple Sclerosis

Introduction: Following the scientific literature in recent years, one can observe an increase in interest in burden (strain, stress) and quality of life of people caring for patients with multiple sclerosis. In our cultural zone, traditionally, this care is usually provided by a close family member, often a spouse or child, most often a daughter who lives with the patient. Caregivers ensure the supply of basic personal hygiene products, help in carrying out daily activities, give emotional support, organize medical services and social assistance.

Methods: Care for a patient may affect the objective and subjective aspects of a guardian's life, such as physical and emotional health, morale, work, finance, social activity, interpersonal relations, and sex life.

Results: Studies assessing the psychological consequences of care found a higher level of anxiety and depression in caregivers than in the general population. The severity of the load

perceived by caregivers depends on many factors, both from caregivers and the patient. They can be summarized as follows: (1) patient-dependent factors: low functional status, presence of depression, presence of behavioral and cognitive disorders, male gender, older age; (2) factors lying on the side of the guardian: older age, female sex, lack of gainful employment, being daughter-in-law, prolonged care, depression, presence of disability, sense of bond, informal social support of the guardian.

Conclusions: Effective rehabilitation leading to the improvement of independence in the performance of everyday activities (ADL) in MS patients reduces the burden on their carers and improve carers quality of life.

Key words: Multiple sclerosis, MS, rehabilitation, quality of life, burden.



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The course of rehabilitation of the patient after C5 fracture treated surgically – case report

Introduction: Spinal injuries at the cervical level are one of the most difficult cases in the rehabilitation process. The most common causes are jumping into the water and traffic accidents.

Aim of study: The aim of the work is to present the goals, difficulties and effects of rehabilitation after a C5 fracture.

Case report: Case report of a 21-year-old boy after vertebral

fracture C5 as a result of jumping into the water on the head.

Summary: Rehabilitation of a patient after a C5 fracture with cramped four-limb paralysis and numerous respiratory and circulatory disorders is an extremely difficult and lengthy process. Nevertheless, it is possible to achieve improvements in patient mobility and self-service.

Key words: water jump, C5 fracture, rehabilitation.



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Relationship between head size and body size in the group of prematurely born children on the threshold of compulsory schooling

Introduction: It is considered that the head circumference is an index of brain size and that there is a relationship between brain size and body size (cephalization).

Aim: Determining whether there is a relationship between head size and body size in the group of prematurely born children at the threshold of compulsory schooling.

Material and method: The study group consisted of 61 children aged 5 to 8 years prematurely born ($\bar{x}=6.38$ years, $s=0.73$). The group was functionally uniform: on the threshold of compulsory schooling. Girls constituted 52% (32 subjects) and boys 48% (29 subjects). The study was conducted in 2015-2016. The research was approved by the Bioethics Committee of the University of Rzeszów. An anthropometric study was carried out according to generally accepted principles. Based on Spear-

man rank correlation, relationships between anthropometric parameters characterizing head size and anthropometric parameters characterizing body size were analyzed.

Results: An example of statistically significant relationships were correlations received between: head circumference and body weight ($p<0.001$), body height ($p=0.002$), BMI ($p=0.022$), chest circumference ($p<0.001$), waist circumference ($p=0.002$), the length of the upper limb ($p=0.007$), and the length of the lower limb ($p=0.008$).

Conclusion: There is a relationship between head size and body size in the group of prematurely born children on the threshold of compulsory schooling.

Key words: prematurity, anthropometry, cephalization



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The analysis of the impact of visual loss on palpatory skills of massage therapists

Introduction: Palpation is one of the basic diagnostic tools. It is commonly thought that people with visual impairment are particularly predisposed to perform palpation. The study was an attempt to define the impact of visual loss on palpatory skills of massage therapists.

Material and methods: There were 58 research participants. They were divided into 3 groups. The first group consisted of the visually impaired massage therapists, the second group included the non-visually-impaired massage therapists and the control group consisted of non-massage therapists. In order to determine the level of palpatory skills, respondents were subjected to the following tests: hair test, weight test, and two-point discrimination measurement within the fingertips, the thenar and hypothenar.

Results: After analyzing the collected data to determine the effect of visual impairment on palpatory skills, it was observed

that there was no statistically significant interdependence in the results of the tests carried out in different groups. However, it should be emphasized that the tests used during the study allowed defining other factors influencing palpation, e.g. age or work experience.

Conclusions: The analysis showed that visual loss does not affect palpation skills, which challenges the stereotype about special predispositions of people with visual impairment to manual work with the body. Additionally, it prevents the phenomenon of occupational stigma. The reason for the equalization of palpation in the studied groups may be modern technology which replaced the need for using Braille by people with visual impairments. The research is only an introduction to the next study which should be conducted on advanced equipment and more numerous groups.

Key words: palpation, visual impairment, massage



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Feet deformities in women are dependent upon specific type of footwear regularly worn

Introduction: A human foot is an important static-dynamic component of the motor system whose overall functionality is determined by a diversity of factors, be that genetic, environmental, or socio-economic, and individual lifestyle. The study aimed to analyse the feet deformation in women of working age depending on the type of footwear regularly worn at work.

Material and methods: The study covered professionally active women, wearing specific type of footwear at work for a minimum of 8 hours a day, 5 days a week during the last 5 years preceding the study. In view of the type of footwear worn, they were split into 3 groups, i.e. Group I comprised women wearing the flat-soled shoes, Group II - women wearing the mid-heeled court shoes (4.0 ± 0.5 cm), whereas group III consisted of women wearing the high-heeled court shoes (10.0 ± 0.5 cm). The study relied on the CQ-ST podoscope for pertinent measurements. One-way analysis of variance (ANOVA), or

alternatively – the Kruskal-Wallis test were applied for statistical assessment of the results.

Results: Statistically significant intergroup differences were found in the values of the indicators determining transverse foot arch and first toe position. Significant dependences were also found between specific type of footwear worn and the incidence of hallux valgus of the right and left foot, and the varus deformity of the fifth toe (β) of the left foot. Detailed results during analysis.

Conclusions: Women employees in the business services sector should promptly have their dress code modified by way of replacing the high-heeled court „stiletto” with comfortable, feet-friendly “shuttles”, with a view to precluding feet deformities.

Key words: dress code, human foot, deformities.



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Thoracic Insufficiency Syndrome (TIS) in the course of scoliosis

Thoracic insufficiency syndrome is a deformation and disorder of the ribs that hinder normal lung ventilation. Due to the three-dimensional deformations of the spine, and especially due to rotation in the course of scoliosis, the angles of ribs are changed. The “vertical” positioning of the ribs on the convex side of the curvature significantly reduces the space for the

lung, while on the concave side the space for the lung is excessively expanded, which in turn causes ventilation problems. It also causes shifting of mediastinal organs with more or less impairment of their functions. In the conservative treatment of scoliosis, the prevention of TIS is the most important goal.



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Assessment of pain occurrence among employees of the administration of the District Court in Krakow

The aim of the study was to assess the occurrence of pain in the group of employees of the administration of the District Court in Krakow. Material and method. A group of 70 women, employees of the administration of the District Court for Kraków-Śródmieście in Kraków. The author's survey, VAS pain scale, and RMI and NDI questionnaires were used for the research. The results of the study were statistically compiled using Microsoft Excell 2013 and Statistica 12 pl ($p = 0.05$). Results. Of the respondents, 41% experienced cervical pain, 31% in the lumbar region, and 19% in both spine sections. Analysis of the results showed no relationship between age ($p = 0.771$) and occurrence of back pain. The nature of the work did not affect the perception of pain ($p = 0.130$). No statistically significant relationship ($p = 0.248$) between time spent working in front of a computer / laptop, between knowledge of ergo-

nomics of working with a computer / laptop ($p = 0.70$) and occurrence of pain was found. Great knowledge of the principles of correct ergonomics of work with a computer / laptop was demonstrated, however, the lack of enforcement was related to the occurrence of pain ailments in the subjects. Conclusions. Back pain syndromes are common among employees of the administration of the District Court for Kraków-Śródmieście in Kraków. The age of the respondents and the nature of the work do not show a relationship with the occurrence of back pain. Seniority slightly influences the occurrence of pain, the occurrence of pain increases with seniority. The respondents declare that they know the rules of ergonomics of working with a computer, but they do not use them, which affects the occurrence of back pain.



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Assessment of the level of knowledge of physiotherapy students of the University of Physical Education in Krakow and the University of Technology and Humanities in Radom in the field of breast cancer prevention

Introduction: The aim of the study was to assess the level of knowledge in the field of breast cancer prevention among physiotherapy students at two universities.

Material and methods: The study covered a group of 98 students, including 68 (69.4%) studying at the University of Physical Education in Krakow and 30 (30.6%) from the University of Technology and Humanities in Radom. The age of the respondents ranged from 18-25 years (average age 21.69 years, SD = 1.26). 16 men (16.3%) and 82 women (83.7%) took part in the study.

Results: Of all respondents, 61 (62.24%) people knew that breast cancer affects both women and men, compared with 18 (18.37%) who indicated that the disease affects only women. Based on the chi-square test of independence, no relation-

ship was found between knowledge of disease risk factors and the university ($p = 0.229$), gender ($p = 0.633$), social status ($p = 0.998$) or place of residence ($p = 0.861$). Based on the chi-square test of independence, no correlation was found for other assessed parameters: knowledge of the importance of performing breast self-examination, knowledge of examination frequency, knowledge of other diagnostic tests outside mammography, knowledge of the definition of mammography, and variables such as: university, social status, place residence.

Conclusions: 1. The social status and place of residence of the surveyed students of both universities have no impact on the level of knowledge about breast cancer prevention. 2. The fact of studying physiotherapy does not predispose you to have more knowledge about breast cancer.



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Occupational pshychological load among health care workers

Introduction. Occupational exposure of health care professionals in practice involves a number of unfavourable adverse occupational factors. These are, in particular, an excessive workload, daily routine with patients, time pressure, extremely high responsibility, communication with patients and other staff. Adverse factors are bringing risk and health threats in mental and somatic symptoms of health care workers, including the burnout syndrome. The aim of the paper is to evaluate psychological risk, focusing on the stress and psychological burden of health care workers.

Material and methods. Cross-sectional study was based on the form of structured anonymous questionnaires evaluating the amount of psychological burden of healthcare staff, according to the criteria of the Meister test. Data collection took place in the year 2017. A group of health care workers was presented by doctors and nurses who worked in the departments of

Dermatology and Venereology, Surgery, Internal medicine, Neurology and Traumatology ward – together the sample of health care workers consisted from 199 participants, 90 medical doctors and 109 nurses.

Results. Our results confirmed the fact that educational level was not related to the level of perceived mental burden. The length of practice among health care workers was statistically significant in the group with very short lengths of practice – these employee showed higher psychological load.

Conclusion. Our cross-sectional study of mental burden confirmed important factors which have to be considered as a health risk factors – length of practice. Educational level didn't have any impact on mental burden in our sample.

Key words: mental load, health care workers, education, length of practice



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Prevalence and of metabolic syndrome parameters in clients of health advice centres during 2003–2012 in Slovakia

Introduction: Metabolic syndrome arises from insulin resistance accompanied with abnormal adipose deposition and frequently from obesity. The aim of our cross-sectional time trends study was to characterize the prevalence of metabolic syndrome and its five risk determinants among the clients of Health Advice Centres of Regional Public Health Authorities in Slovakia during period - 2003 - 2012.

Material and Methods: Prevalence data were estimated in adults and children (≥ 10 years, $N=79\ 904$) from the nationwide electronic database of Health Advice Centres of Regional Public Health Authorities in Slovak Republic "Test of healthy heart" from 2003 to 2012.

Results: The overall prevalence of metabolic syndrome was 30.2% in males and 26.6% in females, abdominal obesity (AO) was confirmed in 48.3% of the male population and 53.9% of females. Increased triglyceride level has higher prevalence

among males (33.3%) compared to females (24.2%). Blood pressure (BP) values and fasting glucose values were significantly higher in the male population than females. We confirmed an increased trend in the age-adjusted prevalence of metabolic syndrome. Abdominal obesity and elevated triglycerides had also increased time trends prevalence in both sexes. The prevalence of people without risk determinants of metabolic syndrome had a time decreasing trend. A surprising finding is the decrease in the proportion of persons with suboptimal HDL-cholesterol.

Conclusion: The increasing prevalence of metabolic syndrome, abdominal obesity, and elevated triglycerides highlights the urgency of addressing these health problems as a healthcare priority to reduce cardiovascular mortality in the Slovak Republic.



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Body composition versus body posture in school-age children and adolescents

Introduction: The study was designed to assess body composition and its effect in body posture, in children aged 6-16 years.

Material and methods: The study took into account primary school students in rural areas of the Podkarpackie Region. Body composition was assessed using Tanita MC 780 MA, and body posture was examined using Zebris system.

Results: The boys were characterised by higher contents of muscle tissue ($p < 0.001$), bone tissue ($p < 0.001$), fat-free tissue ($p < 0.001$) and total body water ($p < 0.001$), as well as greater angle of inclination ($p = 0.018$). The girls were found with higher contents of fatty tissue ($p < 0.001$). The children with

the lower contents of muscle tissue ($p = 0.030$), fat-free tissue ($p = 0.030$), and water ($p = 0.030$) and higher content of fatty tissue measured in kg ($p = 0.027$) presented with greater pelvic obliquity.

Conclusions: Body composition differentiates the body posture in the study group. Fat mass is related to suboptimal scapular and pelvic positions occurring in the frontal plane. Muscle mass is associated with faulty scapular and pelvic positions in the frontal plane.

Key words: body posture, Zebris system, body mass composition



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An impact of muscle strength training in closed kinetic chain on static balance in subjects after a cerebral infarction. Clinical and follow-up study

Introduction: A cerebral infarction represents 85-87% of all strokes. Approximately 60-83% of patients regain their ability to perform activities of daily living after 12 months of the event. All activities of daily living are dependent on maintaining static balance. The purpose of the study is to check how single resistance training with feedback affects static balance in subjects after cerebral infarction.

Materials and methods: Seventy five (75) people (37 women, 38 men) after cerebral infarction and 25 healthy people (12 women, 13 men) were examined. Group sampling was purposive and based on the ratio of the study group to control group being 4:1. The subjects performed a one-off physical activity with audio-video stimulation and feedback. The moment of muscle strength was assessed by means of Leg Tensor device, static balance was assessed by means of Bio-

dex Balance System. Statistical analysis was done by means of IBM SPSS 23.

Results: The subjects received considerably lower results of general stability index as compared with the study conducted before intervention (2.01 vs. 1.57 – $\Delta 0.44$ – 21.9%, $z=3.92$, $p<0.001$). Anteroposterior stability has increased considerably (1.47 vs. 1.15 – $\Delta 0.33$, 22.4% $z= 3.487$, $p<0.001$). Factors affecting the stability were maximum resistance ($\beta=-0.46$ p) and strength ($\beta=0.18$), which accounted for the variance effect of a decrease in the stability index in 33.5% ($R^2=0.335$, $F=4.64$).

Conclusions:

1. Single resistance training formatively affects static balance.
2. Maximum resistance possible and strength gained during training represent significant factors determining an increase in static balance.



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The use of botulinum toxin in the physical & rehabilitation medicine specialist' office

Botulinum toxin is one of the strongest biological toxins, but properly administered in everyday clinical practice is not toxic as has number of applications.

The purpose of the lecture is to present the possible uses of botulinum toxin by the physical & rehabilitation medicine specialist.

The spectrum of registered indications of different botulinum toxin products and includes, among others: focal spasticity of the upper and lower limb in adults, focal spasticity in children with cerebral palsy, blepharospasm, face and neck dystonia, prophylaxis of the headache in chronic migraine, overactive bladder or correction of mimic wrinkles. Thanks to so many

registration indications, botulinum toxin has become one of the most used preparations in medicine. It is due to its extraordinary effectiveness. The number of indications for using botulinum toxin is systematically increasing. Often, its new uses are based only on clinical observations.

Disorders, that can be treated with botulinum toxin in the physical & rehabilitation medicine specialist' office will be presented – from spasticity and dystonia, to various pain syndromes (including neuropathic pain), but also to drooling, hyperhidrosis and tremor.

Key words: botulinum toxin, indications, registration



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Exploitation of Biodex Gait Trainer device in gait rehabilitation patients with neurological disease

Introduction: The use of Biodex Gait Trainer device in rehabilitation nowadays comes is rather rare. Few people can undergo this treatment or are informed about it in Slovakia. Patients hospitalized in neurology ward in Central Military Hospital Ružomberok (ÚVN SNP Ružomberok can undergo this treatment. The need of re-education on walking stereotypes of patients with diagnosis such as sclerosis multiplex, Parkinson disease and sudden brain strike have been known for a long time. The major advantage of Biodex Gait Trainer is subjective adaptation to every patient, even if it is lifting of patient or walking speed.

Objectives: The aim of the thesis has been to determine, how Biodex Gait Trainer effects patient's walking. Secondly to determine the effects of short- term and long- term rehabilitation.

Method: The method of the survey was achieving data from Biodex Gait Trainer device. With repeatedly walking training on Biodex Gait Trainer device we tried to find out, if walking of patients is getting better, stagnates or is getting worse.

Sample: In short- term rehabilitation the exploratory group consisted of 30 patients - 18 men and 12 women. The average age of patients was 62. The most common diagnosis were sudden brain strike (14 patients) sclerosis multiplex (10 pa-

tients). Less common was Parkinson disease (6 patients). In long- term rehabilitation the exploratory group consisted of 30 patients - 15 men and 15 women. The average age of patients was 59. The most common diagnosis was sclerosis multiplex (12 patients). Less common were sudden brain strike (10 patients) and Parkinson disease (8 patient).

Results: The results of short- term rehabilitation shows that daily basis rehabilitation using the device, even if it's short-term, improves physical condition, regularity and step length. It lowers coefficient of variations and have a positive influence on re-education of walking. The results of long- term rehabilitation shows that regular, even if not daily based rehabilitation on Biodex Gait Trainer has a positive influence on neurological patient's walking stereotypes.

Conclusion: Gait rehabilitation represents important rehabilitation treatment in neurology. Its results depend on many factors. However regular short- term and long- term rehabilitation on Biodex Gait Trainer contributes to the acquirement of correct gait stereotypes and motivates patients to progress. We will enunciate complete conclusion on a bigger sample of patients. However, the results of the pilot study are very positive.

Key words: gait rehabilitation, Biodex Gait Trainer



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Music perception. Music as a means of improving cognitive and motor functions

Introduction: Music perception is a broad issue. When we talk about the perception of music, we first of all mean the hearing organ along the auditory tract. The sound we hear is a wave of different frequencies, actually received by the Corti organ on the basement membrane in the inner ear. Further, through the auditory nerve, information is directed to the cortical centers.

Material: The simplified way of hearing above is music, but the music is further processed by the brain, there are several theories for this processing: - dispersed theory- hierarchy theory- brain asymmetry theory. Among researchers, there are ongoing considerations whether musicality is a natural (grounded in evolution) adaptation of man or rather an additional, side group of side-effects for e.g. speech functions. Arguments given by researchers who support the first theory include: relationship with sexual selection, signaling of belonging to a given society, rituals strengthening group ties,

musical interaction of the mother with the child, or emotional regulation, on the other, the researchers put forward these presenting musicality as a “by-product” of language or social functions.

Music therapy is an increasingly appreciated form of therapy. The therapeutic effect of music, as well as the different faces of neurological phenomena associated with music, make distributed music processing theory seem to be the most accurate.

Conclusions: MUSIC AND MOTOR AND KNOWLEDGE FUNCTIONS When we look at the brain scheme in terms of music processing, we can easily indicate the relationships between music processing by cognitive and motor functions. It can be assumed that the theory that musicality is natural to us (conditioned by evolution) is closer to the truth.

Key words: perception, music, music processing.



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Opioid substitution therapy as a direction of medical and social rehabilitation of HIV-infected injecting drug users in Minsk

Introduction: the incidence of HIV infection in Minsk in 2019 is stably high (26.2 cases per 100,000 population), the proportion of the parenteral route of HIV transmission was 33.0%. According to UNAIDS estimates, the probability of HIV infection among IDUs is 22 times higher than among general population, while this indicator is 1,8 times higher for Eastern Europe countries. The HIV prevalence among IDUs in the Belarus increases and reaches 30.8% in 2017.

Material and methods: for analysis, the data from statistical reporting forms of the Minsk City Clinical Narcological Dispensary (N = 3839) and statistical data of OST rooms functioning in Minsk (N = 161) for 2015-2019 were used. The methods of epidemiological diagnosis and statistical analysis were applied for work. Standard packages of statistical programs Microsoft Excel 2010, STATISTICA 10 for data processing were used.

Results: The total number of OST program participants grew and ranged from 149 in 2015 to 161 in 2018. A significant increase in the share of employed program participants (up to 63.64% (CI 55.51-71.23, $p < 0.05$)) and persons in an officially registered marriage (up to 33.77% (CI 26.35-41.82, $p < 0.05$)) shows the effectiveness of the social adaptation of the program members. On average, every fifth OST participant is a woman

(the proportion of women ranged from 20.13-22.36%). There was a significant increase in the number of HIV-infected program participants (rate of increase = 26.32% ($p < 0.05$)), as well as those taking antiretroviral therapy (ARVT) (rate of increase = 30.00% ($p < 0.05$)), and their share in Minsk in 2019 increased from 61.02% (CI 47.44-73.45, $p < 0.05$) in 2015 to 100.00% (CI 95.65-100, 00, $p < 0.05$). Estimated maximum coverage of IDUs with the OST program in Minsk reached 5.28% (CI 4.51-6.14, $p < 0.05$) in 2018.

Conclusions: OST contributes to the medical and social rehabilitation of program participants, including HIV-infected people, adapting them to work and social activities. The maximum coverage level of IDUs with the OST program in Minsk was 5.28% (CI 4.51-6.14, $p < 0.05$) in 2018 and is not sufficient to effectively influence on the HIV infection epidemic process. There has been a significant increase in the adherence of HIV-infected program participants to ARVT, and it's reduces the degree of their epidemic danger to the population as infection sources.

Key words: IDUs, HIV-infected, substitution therapy, antiretroviral therapy.

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Carboxytherapy – its use in the treatment of vertebral algic diseases in lumbar spine

Introduction: Carboxytherapy is a recognised method of reflexive therapy in the treatment of painful syndromes. Uses vasodilating and analgesic effect of carbon dioxide (CO₂), which is injected input to the painful points, triggers points, hyperalgetic skin zones (Jandová 2009).

Material and methods: In our research we for a group of 30 patients (mean age \pm 43 years), which was diagnosed vertebral algic syndrome of the lumbar spine (VAS), we watched the effect of carboxytherapy. It was applied with gas injections. At the one of the puncture application was brought 25-50 ml of CO₂ inputed subcutaneously. A total of 4 punctures served per 2 days, for a period of 3 weeks. In the same time, patients attended a standard physiotherapy treatments of VAS in the physiotherapy department. The effect of the therapy, we evaluated before and after therapy using a standardized questionnaire Oswestry Disability Index (ODI) and using a visual analog scale.

Results: The input data of the questionnaire ODI for the whole group of respondents demonstrated the value of the passed index 4 (40,46%), the output data of the questionnaire ODI testified to the value of index 2 (13,68%). The average degree of experienced pain before the initiation of therapy was 6,83 value of the point, after terapie 2,87 the value of the point. The results of our research have confirmed the positive impact of carboxytherapy in the treatment of vertebral algic diseases.

Conclusion: We have confirmed that the application of CO₂ gas injections decreases the intensity of the experienced pain, has an impact on the dynamics of the spine and a positive influence on several aspects of the daily work and social life. Carboxytherapy has many other potential use for the quick application and low financial burden for the patient.

Key words: Physiotherapy. Carboxytherapy. Vertebrogenic algic syndrome.



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Comparison of motor skills of eight-year-olds, between students of a sports and not profiled school, in Wrocław

Introduction: Motor skills are a complex concept referring to human mobility. Its development is uneven at different stages of adolescence, different for boys and girls. Currently, there is a decrease in physical activity among children and young people. The aim of this work is to assess and compare the motor skills of eight-year-olds attending general and sports schools.

Material and methods: A group of 100 children (50 from each general and sports schools) was examined. L. Denisiuk's test was used to assess motor skills. It included the following tests: strength, speed, power, agility. The endurance test was also added. The research also included evaluation of BMI. The second part of the study was an original questionnaire addressed to parents, which provided information on the physical activity of the examined children and the role of the teacher in the process of shaping attitudes towards sport. The results were analysed statistically at the level of $p < 0.05$.

Results: Significant differences in the results of strength and speed trials were observed in favour of eight-year-olds from

sports school. It was noticed that children from both general and sports school achieve alarmingly low results in case of speed trial. Girls from the sports school performed better in strength, speed and endurance tests compared to girls from the general school. A similar correlation was found for boys in the speed and endurance test. It was observed that children from the sports group attend extracurricular sports activities more often than children from general school, and spend less time on computer and TV entertainment.

Conclusions: On average, children from sports school get better results in motor skills tests than their peers from non-professional school. A higher percentage of children with obesity was found in eight-year-olds from the general school than in the group from the sports school. The study found that the teacher/trainer is a motivating factor for kids to engage in physical activity more often in sports school than in non-profiled school.

Key words: motor fitness, Denisiuk test, BMI, sports school



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Musculoskeletal disorders in patients with COPD. Can physiotherapy be comprehensive?

The complexity of physiotherapy is often understood as the use of all physiotherapy methods and means possible in a given case tailored to the individual capabilities of the patient. It should be assumed that often, together with the physiotherapy program adapted to the main diagnosis, co-morbidities also require improvement procedures. Therefore, it seems that comprehensive physiotherapy should

mean all activities related to rehabilitation measures related to the needs of the patient. This applies, for example, to cardiological and pulmonary patients with locomotor disorders, or to patients with locomotor disorders and concomitant cardiovascular and respiratory diseases.

Key words: COPD, physiotherapy



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The usefulness of partial body weight-supported gait training early post stroke

Introduction: Partial body weight-supported treadmill gait training (ttPBWS) is one of the recent solutions for improving gait in patients suffering from hemiparesis after stroke. The aim of this work was to assess the usefulness of the ttPBWS as the additional intervention added to the standard reeducation program on clinical and kinematic parameters of the patients' gait in the early period of the onset, no later than three months.

Material and methods: The study involved 64 patients, of whom 32 additionally underwent the ttPBWS. In both groups – the experimental and control group a standard gait reeducation program has been carried out. For measurement of the effectiveness of this intervention, clinical scales as well as three-dimensional (3D) gait assessment were used.

Results: On the basis of performed study and statistical analyzes, it was considered that a four-week training with partial body weight support on the treadmill in the early post-stroke period as the additional intervention added to the standard gait reeducation program statistically significantly improve the gait efficiency. On the other hand, there was no statistically significant effect on gait speed.

Conclusions: Partial body weight-supported treadmill gait training is more useful in moderate stroke, age over 65 years, right-sided hemiparesis and a longer period of time from the stroke onset to the beginning of comprehensive rehabilitation program (47-90 days).
Key words: gait reeducation, stroke, rehabilitation, ttPBWS

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Characteristics of health behaviors of women between 50-74 years of age, suffering from osteoporosis and healthy

Introduction: the aim of the study was to characterize women's health behaviors with osteoporosis and healthy between 50–74 years old.

Material and methods: the study was conducted on a group of 400 women who already had menopause. These women benefited from comprehensive diagnostic care at the Malopolska Medical Center in Krakow at the turn of 2016 and 2017. The subjects were divided into two groups: group I - women with osteoporosis (KO) and group II - control group (KZ), healthy women. The research used the diagnostic survey method to assess the health behaviors of the examined women. The research tool was a questionnaire divided into four parts. The first part contained questions about factors predisposing to the occurrence of osteoporosis independent of the examined, resulting from family diseases. In the second part there were questions about osteoporosis risk factors, with which the subject is born. The next part of the survey contained questions about lifestyle risk factors. The last

part includes the record. All patients underwent densitometry with the DEXA method.

Results: Current exercise KO – 36.5%, KZ – 2.5%; frequency of physical exercises (daily) KO-34.5%, KZ -0%; short walk every day KO-77%, KZ-80%. Current consumption of calcium-containing products (daily): milk KO-26.5%, KZ-0%; yellow cheese KO-30.5%, KZ-0%; KO-42% yogurt, KZ-12%; lean cottage cheese KO-36%, KZ-0%. Coffee consumption (several times a day) KO-51%, KZ-15%; smoking KO-37.5%, KZ-3.5%. All women with osteoporosis regularly used vitamin D3 supplementation and calcium.

Conclusions: in the prevention of osteoporosis, broadly understood education including risk factors for this disease should be taken into account, with a particular focus on a balanced diet and regular physical activity, and the avoidance of psychoactive substances.

Key words: osteoporosis, health behaviors, risk factors.



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Influencing the autonomous nervous system in the prevention and treatment of civilization diseases

The autonomous nervous system (ANS) has an overall regulatory function and is involved in several pathophysiological mechanisms of various diseases. Several classical and psychosocial risk factors for cardiovascular disease such as depression, hostility, anxiety, elevated cholesterol, sugar, obesity and smoking have been shown to be associated with reduced autonomous heart control. ANS dysfunction creates conditions for the development of atherosclerosis and arterial thrombosis. Excessive sympathetic activity may also contribute to the development of metabolic syndrome. Sympathetic activity increases with aging, which is one of the causes of blood pressure rise along with increasing age and weight. Increased sympathetic reactivity to stress is an important pathophysiological mechanism that mediates the effects of psychosocial stressors

on the pathogenesis of somatic diseases. Autonomic imbalance may be a final common pathway to increased morbidity and mortality from a host of conditions and diseases, including cardiovascular disease. According to several authors, the modification of tone and activity of the autonomic nervous system can contribute significantly to the prevention and treatment of several civilization diseases. Rehabilitation medicine and physiotherapy have several methods that can non-pharmacologically modify the tone and activity of the autonomic nervous system. The aim of this presentation is to introduce several of these possibilities and to present our experience with biofeedback of heart rate variability (HRV biofeedback). **Key words:** Autonomic nervous system dysfunction, risk factors of civilization diseases, HRV biofeedback

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Vertigo in elderly persons – a challenge for a multidisciplinary team

Vertigo is common in elderly persons and may lead to substantial morbidity by increasing the risk for falls, anxiety, social isolation and decreasing of the quality of life. Vertigo in elderly may be related to vestibular diseases: benign paroxysmal positional vertigo, Meniere disease, vestibular neuritis, postlabyrinthitis vestibulopathy, migraine, vertebrobasilar insufficiency, and non-vestibular reasons: frailty, multisensory disequilibrium, hypotension, medication (sedatives, anticholinergics, antihypertensives) and psychoactive substances. The loss of vestibular and balance functions associated with aging is referred to as presbyastasis. Establishing a correct diagnosis of vertigo cause is challenging, and should be based on a properly taken patient's history and problem-oriented physical examination. In early diagnostics, this is crucial to exclude/confirm a stroke as a cause of acute vertigo. Addressing of non-stroke-related vertigo should start from checking and optimisation of medications taken by a patient. Vestibular Rehabilitation Therapy (VRT) encompasses interventions addressing abnormal sensation of disbalance, head position and body posture, instability evoked by motion, unstable gaze. VRT components include canalith repositioning procedures, adaptive, substitutive exercises, balance training, habituation of symptoms. VET may also encompass virtual reality biofeedback exercises, electrotactile vestibular substitution, and

hydrotherapy. Since evidence of the efficacy of VRT in the improvement of activities and participation is lacking, vocational interventions seem to be necessary for the implementation of VRT effects in everyday life. Falls prevention consists in the removal of indoor and outdoor obstacles, equipping of a direct environment with proper lightening, dedicated assistive technologies (grips, anti-skid mats, elevated sits), providing patients with adequate footwear, clothing, communication devices and personal aids (orthoses, canes, walking frames). Patient's and caregiver's education and training should deliver knowledge on fall prevention and adequate proceeding after fall. Psychological counselling and therapy should address depression, kinesiophobia, fear of falling, agoraphobia and social phobia.

Conclusions: Vertigo in elderly persons in multicausal and establishment of proper diagnosis is sometimes difficult. Therapy should be individualized and diagnosis-based. Effective treatment of vertigo and prevention of its consequences should engage multidisciplinary team including physicians (physical and rehabilitation medicine specialists, neurologists, laryngologists), vocational therapists, physiotherapists, nursing staff, psychologists, social workers, orthopaedic technicians. Active participation of patients and caregivers is key to the effective proceeding.



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Possibilities of using kinesiotherapy in the period of puerperium after physiological birth

Introduction: After birth, the whole body of a woman changes. Anatomical, functional and biomechanical changes of the musculoskeletal system occur. Kinesiotherapy offers a large number of exercises and methods aimed at the musculoskeletal system during the period of puerperium.

Objective: The aim is to point out the role of kinesiotherapy in women in the puerperium in the return of the locomotor system to the pre-pregnancy condition.

Methods: We have chosen a case report method. The condition of the musculoskeletal system was evaluated by initial examinations followed by a proposed kinesiotherapeutic program. After month and half of the program, we evaluated the locomotor system by final examinations. The study was solved within the project KEGA no. 008PU-4-2019 Multidisciplinary Approach to Teaching Midwives and Physiotherapists in The Care of a Woman Using Multimedia Technologies.

Results: Initial examination revealed deviations in curvature and mobility of the spine, pelvis position, head posture, shoulder position, abdomen prominence, valgus knees, reduction of foot arch, mild abdominal diastasis, shortening of mm. scaleni, erector spinae in the lumbar region and pectoral muscles, decreased muscle strength of selected muscles and pain in the area of external genitalia after suturing and in the area of cervical and sacral spine. With the kinesiotherapy program, we adjusted postural variations, strengthened muscles and relieved pain.

Conclusions: Kinesiotherapy plays an irreplaceable role in the puerperium. It makes it easier for a woman to manage changes in the musculoskeletal system. Kinesiotherapy means must be used for a long time to prevent the development of other pathologies from congestion during childcare.

Key words: Kinesiotherapy. Puerperium. Pregnancy. Woman.

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Evaluation of morphological feet structure of non-dancers and dancers depending on dance kind: modern and folk.

Dance depicts the beauty of both movement and human body itself. It requires many training hours which can substantially impact the structure of dancer's feet.

Aim of the study: Comparison of the morphological feet structure of modern and folk dancers versus non-dancing people.

Material and method: The study was conducted among 128 women whose age averaged 17.29 years \pm 1.25 year, BMI 21.16 \pm 2.81. The study group was 59 people (46%) consisting of 32 folk dancers (25%) and 27 modern dancers (21%) and a control group of people not dancing (69 people 54%). There were no significant age or BMI differences between the groups. The criterion that determined a person belonging to the study group was a minimum of 3 years dancing experience, to control group – no dancing involvement.

The study was conducted by using a proprietary questionnaire, Tanita MC780MA weight, Tanita height meter. Participants' footprints were collected by using plantoconturograph meth-

od which determined the angles of: toe valgus (ALPHA), toe V varus (BETA), longitudinal (CLARCK'S) and transverse (GAMMA) arches. Statistical analysis was carried out by using either U Mann-Whitney's test or Student's t-test.

Results: The analysis of the data has shown significant differences between the study and control groups regarding angles: BETA of left foot 14,9°L and 13,1°L respectively, CLARCK'S of both feet (55,3°L and 50,0°L) (56,8°P and 50,0°P) respectively and between modern and folks dancers in angles: BETA (17,0°L and 13,1°L, 17,0°P and 15,0°P); GAMMA (16,4° L, 13,8°L; 17,6°P and 15,6°P); CLARCK'S (58,2°L and 52,9°L; 61,0°P, 53,2°P).

Conclusions: Dancers are mostly showing excessive longitudinal arch, normal transverse arch. Dancing, especially the modern kind, predisposes the occurrence of toe V varus and high arch foot.

Key words: dance, foot structure, body building



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Morphofunctional development of 11–13 year old swimmers

Introduction: This project is aiming to compare differences in the morphofunctional development between the groups of boys attending school with compulsory swimming classes (sport class) with their peers attending regular classes without the swimming.

Materials and methods: The study was a cross-sectional comparative analysis of a non-randomized group of participants. 26 boys aged 11-13 participating in regular swimming classes were qualified to the examined group. The control group consisted of 27 boys in the same age group participating to the basic teaching profile. The following parameters were assessed: body building parameters (body weight together with the percentage of body fat, body height, Body Mass Index (BMI)), participants' efficiency using the modified Ruffier test, respiratory efficiency based on the assessment of peak expiratory flow rate (PFR) and any apnea time (Flack test) as well as physical fitness was assessed using the Zuchory test

Result: The assessed groups did not differ statistically significantly in terms of age and body height. Other antropometric indicators differed statistically significantly. It was demonstrat-

ed that participants from the examined group were characterized by significantly lower body weight and a statistically significantly lower BMI value ($p=0.0002$). In this group, a significantly lower percentage of fat content ($p<0.0001$) was found. The average PFR value in the examined group was higher compared to the control group but the difference was not statistically significant ($p=1054$). The PFR value in the examined group expressed as a percentage in relation to the adopted norms was statistically significantly higher compared to the control group ($p=0.0184$). In terms of duration of opnea time (Flack test), assessment of efficiency and physical fitness, a statically significantly higher level was found in the examined group.

Conclusion: The undertaken examination is sustaining that swimming has positive influence onto morphological and motoric development of the examined group of boys. The results advocate for increased Physical Education classes with the emphasis onto swimming.

Key words: swimming, morphofunctional development, boys 11-13 years old

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Analysis of the associations between quality of life and range of cervical spine rotation, severity of pain as well as disability level in patients with axis fracture

Introduction: The study is designed to evaluate quality of life and functional performance in patients with a fracture of the axis, and to investigate the relationship between quality of life and the range of cervical spine rotation, pain intensity, and level of disability in these patients.

Material and Methods: The study involved 100 patients receiving treatment due to axis fracture. Quality of life and functional performance were assessed using SF-36 Questionnaire and Neck Disability Index (NDI). Cervical spine mobility was assessed with Cranial Range of Movement (CROM) goniometer and pain intensity was evaluated using Visual Analogue Scale for Pain (VAS).

Results: The subjects' quality of life was poorer with respect to the mental dimension (MH-69.1%) compared to the physical dimension (PH-54.4%). Based on the NDI survey, the rate

representing the patients' functioning in daily life amounted to 17.7% which reflects mild limitations in functional abilities. It was shown that the range of cervical spine rotation (both right and left) was related to the patients' disability level, as measured by NDI ($R=-0.4$, $p=0.0001$). The model of regression was statistically significant for overall quality of life ($F=48.24$ $p<0.001$), as well as physical dimension ($F=45.1$ $p<0.001$) and mental dimension ($F=25.35$ $p<0.001$).

Conclusions: The degree of disability in the NDI scale, the severity of pain in the VAS scale and the range of cervical spine rotation significantly affect the overall SF-36 score, both in physical and mental terms.

Key words: cervical spine, fracture of the axis, rotation, quality of life, pain, disability



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The assessment of the impact of a 12-week choreotherapy-supported exercise program on the efficiency of upper limb function and the quality of life of elderly people using a wheelchairs, living in nursing homes – randomized control study

Introduction: A wheelchair is often prescribed for the elderly to solve the problem of limited mobility. However, the use of utensils supporting may reduce the independence in daily activities, and deteriorate the quality of life.

Aims: Assessment of the impact of a 3-month exercise program with elements of choreotherapy on the efficiency of upper limb function and quality of life of elderly people using a wheelchair, living in nursing homes.

Material and methods: The study comprised elderly people aged 65 to 85, using a wheelchair, staying in nursing homes in city of Rzeszów and the surrounding area. Persons meeting the inclusion criteria were randomly assigned to one of three parallel groups: group I - general fitness exercises (n = 55), group II - exercises with elements of choreotherapy, supported by instruments (n = 55), group III - control (n = 55).

Data were collected at baseline of the exercise program, after 12 weeks of exercises, and 24 weeks after starting the study.

Results: After completing the 12 week exercise program, a statistically significant improvement in upper limb fitness and quality of life was demonstrated in groups I and II. In group III statistically significant deterioration of results in the examined aspects was found. Improvement in upper limb fitness remained within 3 months of the end of the exercise program.

Conclusions: 1. Group exercises with elements of choreotherapy improve the efficiency of the upper limb and increase the quality of life of the elderly. 2. The proposed exercise program is inexpensive and easy to implement in everyday practice of physiotherapists working with wheelchair-dependent elderly people in nursing homes.

Key words: elderly, exercises, dance movement therapy



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Efficacy of the Modified Ashwort Scale and the Tardieu scale in the assessment of spasticity in children with cerebral palsy

Introduction: Cerebral palsy is considered the main cause of disability in Poland. It is estimated that 20-25 thousand children have this syndrome. One of the main problems of patients with CP are muscle tone disorders. The most common is spasticity, which can affect up to 90% of all types of CP. It results in damage of the upper motor neuron, which effects can be observed in many aspects of everyday life. Crucial element in the planning of therapy for this group of patients is correct diagnostic, also in the field of muscle tone. Currently, the most-used scale for this assessment is the Ashwort scale or the modified Ashwort scale. The aim of the thesis is to assess the efficacy and suitability of Tardieu scale and the mod-

ified Ashwort scale in physiotherapeutic practice with children with cerebral palsy.

Material and methods The study group consisted of children with diagnosed cerebral palsy participating in two-week rehabilitation stay from January to June 2018. The research was carried out on two scales: the Modified Ashwort Scale and the Tardieu Scale. Each child was examined twice: at the beginning and at the end of the stay. The study involved 30 people aged from 5 to 28 years (average 10,8).

Results and conclusions: Using the Tardieu scale, the study group showed a decrease in spasticity (median decreased by about 5% in the study group).



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Evaluation of provocative stretching tests in relation to radiological changes in patients over 50 years of age with pain in the lumbar spine

Introduction: Stretch tests are commonly used to assess the degree of irritation of nerve roots by damaged interbody discs.

Aim: The aim of the study was to assess the size of structural changes in the intervertebral discs in imaging tests in relation to the results of tensile tests. The aim of the study was to answer the question: Is irritation of the nerve roots related to the extent of intervertebral disc damage, and whether individual sensitivity affects the result of the nerve root stretching test?

Material and methods: The study group is a population of women over 50 years of age with lumbar spine pain. The study involved 277 women who were diagnosed using computed tomography (CT) and provocative tests of the nerve roots

of the lumbosacral spine. The NRS scale was used to assess back pain.

Results: The research looked for a correlation between the size of herniation / herniation of the interbody disc (CT) and the angle of elevation of the lower limb (provocation tests).

Conclusions:

1. The value of tensile tests is confirmed by imaging tests showing a relationship with the degree of disc damage.
2. Pain in the spine is not related to the size of the intervertebral disc hernia.
3. Positive provocation tests may be the result of changes other than intervertebral disc injury.

Key words: Laseque test, lumbosacral spine, computed tomography



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USG of the shoulder girdle in physiotherapy – diagnostics and sonofeedback

Training plan of workshops consist of ultrasound anatomy of the shoulder girdle structures as joints, tendons, muscles, ligaments, bursa, labrum and others, ultrasound assessment of common shoulder disorders e.g.: impingement syndrom of the shoulder, sonofeedback as a physiotherapy tool: teaching the

correct shoulder movement patterns, verification and modification of the rehabilitation effects. The workshop contains the theoretical part, practical demonstrations and practical exercises of ultrasound examination.



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The influence of the size of the *linea alba* on the body posture of children

Introduction: The linea alba is formed by a fibrous band running medially from the xiphoid process to the pubic symphysis. Abdominal straight muscle stretch is the separation of both straight muscles sideways within the linea alba. Stretching or sagging connective tissue of the linea alba does not cause pain within the anterior abdominal wall. The correct tension of the abdominal muscles allows the organs to be kept in the right place and their proper pressure on the lumbar region of the spine. This has a preventive effect on the deepening of lumbar lordosis and pelvic tilt. During the dissolution of the abdominal straight muscles, there may be disturbances in body posture, which may provoke the occurrence of pain in the lumbar spine in the future. Moreover, abnormal muscle development can affect imbalances by reducing spine stability and disturbed body statics.

Objective of the work: The aim of the study is to assess the impact of the size of the white border on the body posture and balance of children.

Material and method: The study included 60 patients treated in the Physiotherapy Department of the Świętokrzyskie Pediatrics Center in Kielce. The age range of the studied group was in the range of 6-9 years. By sex, the group consisted of 29 boys and 24 girls. The interview and medical examination did not show any comorbidities that could affect the reported symptoms. Body posture was examined using Diers Formetric 4D for accurate analysis of the spine. The balance was tested using Diers Pedoscan. Statistical analysis of the results was made using the Statistica 13 software.

Conclusions: 1. There is a need to conduct further research on the impact of the size of the linea alba and the straight muscles of the abdomen of children on body posture.

2. The DIERS formetric system is a tool enabling precise control of therapeutic effects.

Key words: body postures, DIERS, linea alba



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Physiotherapy in the Polish intensive care unit compared to selected foreign centres

Introduction: The aim of this work is to present the specifics of physiotherapy in the Polish intensive care unit (ICU) compare to selected foreign centres. During the presentation, the possibilities of physiotherapy in Polish ICU will also be presented, inspired by the activities and experience of physiotherapists (PTs) from other countries.

Material and methods: According to the Regulation of the Minister of Health from 2016 and the guidelines of the Polish Society of Anaesthesiology and Intensive Therapy from 2012, only ICU with the highest reference level are obliged to employ a physiotherapist in a half-time basis. Currently, in many hospitals, physiotherapy in ICU is provided sporadically and PTs working there are doing most of their job in another departments. For example, in Brazil, in some hospitals, PTs in

ICU work in three shifts, and after acquiring the appropriate qualifications gain broader competences.

Results: Professional physiotherapy is an obligatory part of the patient's treatment from the moment of their admission to ICU. It involves stimulation of functional activities including respiratory therapy, bed mobilization, stage upright standing, and gait re-education. Moreover, ICU staff should cooperate with each other in the process of treatment, due to the dynamic changes in the condition of the patient.

Conclusions: Physiotherapy in ICU should be: 1. Individually adapted to the patient's functional capabilities. 2. Supported by all ICU staff. 3. Involving relatives and the patient's family. 4. Including maximum functional stimulation of the patient.

Key words: physiotherapy, intensive care unit (ICU)