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FEATURES OF PHYSICAL THERAPY FOR TOTAL HIP ARTHROPLASTY

Actuality. *In recent years, the problem of degenerative-dystrophic diseases of the musculoskeletal system of the elderly has become very acute, which is associated not only with the aging processes that occur in the body, but also with the tense current situation in Ukraine. The largest percentage of degenerative-dystrophic changes is hip joint diseases. Timely total hip replacement allows the patient to restore function and return to active professional activity. However, an important component of the recovery of patients is physical therapy, which is constantly developing, new modern means are emerging that should be used to increase the efficiency of the rehabilitation process.*

The aim of the research *is to develop and evaluate the effectiveness of a comprehensive program of physical therapy for the elderly with total hip arthroplasty.*

Materials and methods. *The basis of the work is a complex program of physical therapy for 42 elderly people with total hip arthroplasty. The functional indicators of the hip joint were studied, and the assessment of movement according to the 6-minute walk test, scale Harris Hip Score, Trendelenburg test and indicators of pain intensity during active movements were analyzed. A comprehensive program of physical therapy with four periods: per-operative, acute, post-acute and long-term is proposed. It included education of the patient about his disease, therapeutic exercises, lymphatic drainage massage, mechanical therapy, kinesiology taping, physical therapy, management of pain, swelling and scarring.*

Research results. *According to the results of the conducted research, the effectiveness of the complex program of physical therapy for the elderly with total hip joint replacement was proven, which was manifested in the improvement of functional indicators, reduction of pain sensations, increase of muscle strength and improvement of their quality of life.*

Conclusions. *The complex physical therapy program developed and applied in clinical conditions for elderly patients with THA is a high-quality rehabilitation technology that allows to minimize clinical and functional indicators, improve muscle strength, quality of life and reduce the risk of falling.*

Key words: *hip joint, endoprosthesis, old age, physical therapy, therapeutic exercises.*

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ОСОБЛИВОСТІ ФІЗИЧНОЇ ТЕРАПІЇ ПРИ ТОТАЛЬНОМУ ЕНДОПРОТЕЗУВАННІ КУЛЬШОВОГО СУГЛОБА

Актуальність. *Останніми роками дуже гостро постає проблема дегенеративно-дистрофічних захворювань опорно-рухового апарату людей похилого віку, що пов'язано не тільки з процесами старіння, які відбуваються в організмі, але й із напруженою ситуацією в Україні. Найбільший відсоток дегенеративно-дистрофічних змін припадає на захворювання кульшового суглоба. Своєчасне тотальне ендопротезування кульшового суглоба дозволяє хворому відновити функцію та повернути його до активної професійної діяльності. Проте важливою складовою частиною у відновленні хворих є фізична терапія, яка постійно розвивається, з'являються нові сучасні засоби, які доцільно використовувати для підвищення ефективності реабілітаційного процесу.*

Мета дослідження *– розробити та оцінити ефективність комплексної програми фізичної терапії для людей похилого віку при тотальному ендопротезуванні кульшового суглоба.*

Матеріали та методи. *В основі роботи – комплексна програма фізичної терапії 42 осіб похилого віку при тотальному ендопротезуванні кульшового суглоба. Вивчалися функціональні показники кульшового суглоба, оцінка пересування за 6-хвилинним тестом ходи, шкалою Harris Hip Score, пробою Тренделенбурга та аналізувалися показники інтенсивності болю під час активних рухів. Запропонована комплексна програма фізичної терапії з чотирма періодами: передопераційним, гострим, післягострим та довготривалим. Програма включала освіту пацієнта з питання його захворювання, терапевтичні вправи, лімфодренажний масаж, механотерапію, кінезіологічне тейпування, фізіотерапію, менеджмент болю, набряку та рубця.*

Результати дослідження. *За результатами проведених досліджень доведена ефективність комплексної програми фізичної терапії для людей похилого віку при тотальному ендопротезуванні кульшового суглоба, що проявлялось у покращанні функціональних показників, зменшенні больових відчуттів, збільшенні сили м'язів та покращанні якості їхнього життя.*

Висновки. *Розроблена та застосована в клінічних умовах комплексна програма фізичної терапії для пацієнтів похилого віку при ТЕКС є якісною технологією реабілітації, яка дозволяє мінімізувати клініко-функціональні показники, покращити силу м'язів, якість життя та зменшити ризики падіння.*

Ключові слова: *кульшовий суглоб, ендопротезування, похилий вік, фізична терапія, терапевтичні вправи.*

Introduction. The main reasons for total hip arthroplasty (THA) are coxarthrosis, accounting for 90%, hip fracture, avascular necrosis, dysplasia, and inflammatory arthritis (Ha et al., 2016). Coxarthrosis is a painful chronic joint disease characterized by structural changes throughout the joint, including loss of articular cartilage, the presence of osteophytes, inflammation of the synovial membrane, subchondral bone changes, muscle weakness, and ligament sprains. This is the result of a complex interaction of genetic, metabolic, bio-mechanical and biochemical factors (Ferguson et al., 2018).

One of the most common operations in the world among the elderly is THA, which is aimed at solving the problems of progressive joint degeneration. It is prescribed to patients with a severe course of the disease, which is not amenable to conservative treatment and is defined by constant moderate or severe pain, functional limitations in walking, difficulties while sitting, putting on shoes and socks, inability to perform everyday activities (Zlatičanin et al., 2024).

Recently, much attention has been paid to the improvement of endoprosthesis techniques, the use of modern endoprostheses that could last longer. All these changes contribute to the reduction of the acute period and allow to minimize duration the patient's stay in the hospital, however, for patients, further physical therapy is a very important component, which should be not only in the conditions of inpatient treatment, but also continue for a long period.

Studies carried out by domestic and foreign scientists (Omeragić et al, 2019; Skalski et al., 2019; Zlatičanin et al., 2024; Konnyu et al., 2021; Houdek et al., 2014) indicate a significant improvement in the quality of life of people after THA in the short term, however, already after a year, patients begin to complain of persistent pain, a deficit of amplitude in the hip joint, a decrease in the strength of hip muscles, gait speed and functional limitations. The weakness of the thigh and lower leg muscles in elderly people who underwent THA on the background of accompanying patients often leads to a high risk of falling, affects static and dynamic balance (Ferguson et al., 2018; Domínguez-Navarro et al., 2018). Complex physical therapy is an important component of the recovery of persons after THA. In our opinion, it is appropriate to develop a physical therapy program for THA taking into account the above features.

The aim of the research isi to develop and evaluate the effectiveness of a comprehensive program of physical therapy for the elderly with THA.

Materials and methods. The research was carried out on the basis of KNP KOR "Kyiv Regional Clinical Hospital" and the Department of Physical Rehabilitation

and Sports Medicine of NMU named after O.O. Bogomolets in the period of 2023–2024. The medical diagnosis was made by a traumatologist based on the results of an X-ray and computer tomography. They took part in the study 42 patients aged from 56 to72 years (average age – 62.15±4.56). Among the patients: 33 (78.5%) had stage from 3 to 4 coxarthrosis, 9 (21.5%) of post-traumatic arthrosis. Right-sided damage of the hip joint was present in 23 (54.7%) patients, left-sided was present in 19 (45.3%) patients. All patients who participated in the study had unilateral coxarthrosis. In the anamnesis, 14 patients (33.3%) had coxarthrosis of the 1st and 2nd degree of the opposite hip joint, however, during the examination of functional indicators, they had no limitations, as well as complaints of pain. The analysis of the questionnaire revealed that 12 (28.5%) patients suffered from stages 3 and 4 on coxarthrosis for about 5 years, 23 (54.7%) patients for about 3 years, and 7 (16.6%) patients for more than 1 year.

All patients were given full information about the study and their consent was obtained through written informed consent.

We conducted an examination 2 weeks before endoprosthesis and after surgical intervention 3, 6, 12 months. Was analyzed the patient's medical history, the functional assessment of the hip joint was evaluated according to the scale Harris Hip Score, which includes assessment of the following indicators: pain, function, deformity and range of motion.The sum of points on the Harris Hip Score scale from 100 to 90 is considered excellent, from 89 to 80 is good, from 79 to 70 is satisfactory, and less than 70 is unsatisfactory.

In order to assess the quality of the completed comprehensive program of physical therapy, a visual analog pain scale (VAS) was used for the presence of pain in people before and after THA, where 0 is no pain, 10 is unbearable pain. Considering that most elderly people at the stage from 3 to 4 coxarthrosis have weakness of the hip abductor muscles, we used the Trendelenburg test for their assessment. Exercise tolerance and movement speed were assessed using the 6-minute walk test.

All data obtained in the study were processed by the method of mathematical statistics using the "STATISTIKA10.0 Program". Data are expressed as mean ± standard deviation (SD). Fisher's test was applied to test for normal distribution of the study variables. In case of non-normal distribution, a logarithmic transformation was performed. Two-way repeated measures "STATISTIKA 10.0" was used to compare the obtained indicators between the beginning and the end of the study. The reliability of the obtained changes was determined by the Wilcoxon test for non-parametric data, the reliability coefficient of the results was $p<0.01$.

After conducting a preliminary study and to substantiate the effectiveness of the developed complex program of physical therapy for THA, elderly patients (n=42) were divided into two groups: control and main ones. The control group (n=21) worked according to the program of the medical institution, the basic group (n=21) according to the program developed by us.

The physical therapy program for control group (CG) patients differed in the beginning of rehabilitation measures and the means used. Preparatory and rehabilitation measures were not carried out in the preoperative period. The program began the next day after THA and included therapeutic exercises (breathing, general-developing, special), verticalization, movement with crutches, cold therapy for the first 2 days, magnetolaser procedures on the wound for 10 procedures, therapeutic massage 4 weeks after THA. In the post-acute and long-term periods, CG patients performed complexes of therapeutic exercises at home provided by a physical therapist.

The complex program of physical therapy for the elderly basic group (BG) with THA included 4 periods: pre-operative, acute, post-acute and long-term. It began with the education of the patient: understanding of his etiology, pathogenesis of the disease, target expectations after surgery, time frame for their achievement. The training focused on the benefits of changing the patient's lifestyle, discussing with other members of the multidisciplinary team the development of strategies to achieve the goals.

The pre-operative period was aimed at increasing the level of muscle strength, since the majority of people in our country, who undergo THA with stages 3–4 coxal arthrosis, have a low level of muscle strength, limb shortening, reduced tolerance to physical exertion, which is associated with long-term postponement of the operation due to lack of funds. Therapeutic exercises were aimed at improving hip movements: abduction, flexion, extension, and increasing the strength of muscle groups: gluteus maximums, gluteus mediums/minus gluteus maximums, quadriceps, hamstrings, adductor and calves.

In the preoperative period, patients were taught therapeutic exercises for the acute period, movement on crutches, walkers, and training of uniform load on the affected limb (using weights).

The global goal of the complex program of physical therapy was to reduce symptoms such as pain and inflammation, to improve function such as restoration of mobility, strength, proprioception, endurance, coordination, which are achieved by systematically increasing the load. The load depended on the physical and functional condition of the patients and their functional needs.

All patients underwent cementless THA. To reduce complications after surgery, patients were forbidden for the first 3 months to cross their lower limbs. They were also forbidden to increase the angle between the trunk and lower limbs by more than 90 degrees, rotate the operated limb to the middle, outward, and sleep on the operated side.

Acute period (1–7 days). After THA in the acute period, patients were in a bed with a wedge-shaped pillow. Cold therapy was performed on the operated area 2 times a day for 10 minutes (Table 1).

In most cases, vertical positioning was performed on the day of the operation, first in bed, then with the lower limbs lowered, standing up and walking with a walker around the ward. In order to prevent thrombosis, it was mandatory to bandage the operated limb with an elastic bandage or to wear compression stockings. Patients who had a low risk of falling were taught to move with elbow crutches according to the principle of "ski walking" by loading the operated limb by 40–50%, patients with an average risk of falling walked on walkers (7 people). Lymphatic drainage massage of the lower extremities was performed from the 3rd day after ultrasound diagnosis and exclusion of thrombosis. Patients' mobility and independence were increased daily by teaching them to sit down, get up from bed, chair, walk around the ward, corridor and stairs. In order to reduce pain sensations,

Table 1

Therapeutic exercises for the elderly with THA

Therapeutic exercises	Number, repetition	Justification
Preoperative period		
Active exercises for upper and lower limbs (resistance exercises, weights, Thera-bend)	12–14 times 2 times a day	To strengthen muscles, increase the amplitude of movements
Passive movements, joint play	10–15 minutes	
Isometric tension of the quadriceps and gluteus muscles	10 times for 7 seconds. 5 times a day	
Learning exercises for the acute period	Daily for 10–15 minutes.	
Acute period		
Isotonic exercises for the distal parts of the lower limbs (flexion, extension)	12–14 times (4–5 times a day)	Prevention of thrombosis, improvement of trophic processes in the lower extremities
Isometric tension of the quadriceps and gluteus muscles	12 times for 5–7 seconds. 7 times a day	Improve muscle tone of the operated limb and reduce swelling
Raising the pelvis with support on the healthy lower limb	5–7 times 2 times a day	Strengthening of gluteus quadriceps muscles
Lifting straight lower limbs in turn	5–7 times 2 times a day	
Respiratory – static, dynamic, with a breathing simulator	7–10 times once a day	Prevention of complications from the respiratory system
Post-acute period		
All exercises of the acute period were performed	14–16 times (4–5 times a day)	
Lifting of the straight operated limb upwards, starting from the 4th week, 0.5 kg was added to the limb.	10–12 times 2 times	Strengthening of thigh muscles
Lying on the healthy side with a pillow between the legs, removal of the operated limb with restraint (insurance is mandatory at the beginning).	10 times for 5 seconds. 3 times a day	Muscle strengthening
A long period		
Exercises from starting positions sitting, standing, lying with resistance, dumbbells, rubber	14 times for 2 approaches	Strengthening of the muscles of the lower extremities
Next to the Swedish wall, standing sideways, perform lunges with each leg in turn	10 times 2 times	Strengthening quadriceps, hamstrings and calf muscles improving balance and proprioception
In a standing position, a stand on one leg (at the beginning with insurance)	15 repetitions x 1 approach	
Holding the position standing on the Bosu ball	5 repetitions x 2 approaches	
Ascent and descent on the Bosu ball	5 repetitions x 2 approaches	

transcutaneous electronic neurostimulation (TENS) was prescribed once a day for 10 minutes.

Post-acute period (8–21 days). Physical therapy goals: walking independently for short distances with aids on a level surface, independent getting up from a chair, getting in and out of a car, putting on socks and pants with aids, walking up stairs, picking up objects from the floor, preparing food, improving functional performance and muscle strength in the operated hip joint, gradual adaptation to physical activity.

After removing the stitches, therapeutic exercises with the scar began on the 12th–14th day: pressing along its length, stretching it in length and width with the aim of increasing its mobility and elasticity.Therapeutic exercises for the acute period were continued, added from the initial standing position, and the load gradually increased. 2 months after the X-ray examination, the patients were allowed to walk without aids for additional movement. Great attention was paid to teaching the patient his plan of rehabilitation measures, which he had to carry out independently at home after discharge. Classes were held on an exercise bike starting from 5–7 minutes. gradually increasing to 10 min. at the end of the period.

*Technique of kinesiological taping on a scar:*for the application, I-shaped tapes are needed, the number depended on the length of the scar from 15 to 20 strips, which began to be glued with an anchor to the scar without tension, then moving the skin to the side by 20%, alternately one tape was applied from the right side, the second from the left, and so on to the end of the scar. This application, during therapeutic exercises, helped to move the skin and scar, making it elastic and mobile. The application was applied after removal of sutures and healing of the wound for 3 days, the number of series was 5.

*A long period (3 month).*The key variables of this period, which is the longest in duration, are the increase in the strength of key muscle groups. As the pain subsided, activity increased, an important aspect being the restoration of normal gait pattern and cardiovascular endurance. Another important aspect of this period is self-efficacy and the ability to perform rehabilitation activities to achieve specific goals with the physical therapist. The experience of mastering the patient's necessary skills during physical therapy in a hospital contributed to increasing self-esteem and maintaining physical activity in the long term. In the long-term period, patients continued to perform therapeutic exercises at home, monitoring was carried out with the help of telemedicine, for feedback, support, encouragement and evaluation of the implementation of the our physical therapy program. Emphasis was placed on the cardiovascular system by increasing the volume of walking, since the severity of pain sensations was already weak. Alternative means that were recommended to patients were Nordic walking, swimming, classes on elliptical trainers.

Research results. After the completion of the complex program of physical therapy for the elderly at THA, control testing was conducted. Since the main complaint of the patients that led them to THA was pain, it was evaluated during active movements. The indicators in the basic group (BG) before the physical therapy program were 74.3±0.3 points, in the control group (CG) 74.6±0.7 points, which indicated very strong pain (p>0.01) (Fig.1).

The Trendelenburg test was positive in all patients, indicating weakness of hip abductor muscles and the effect of limb shortening, which was present before TEX in 28 patients.

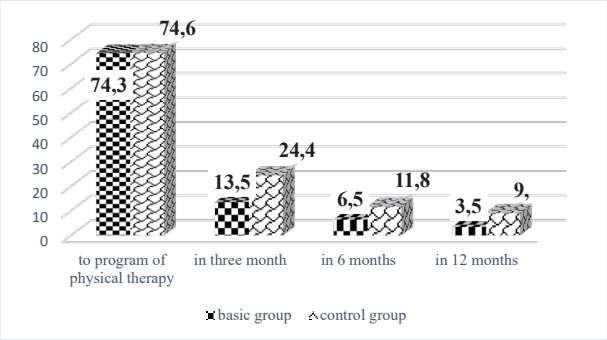

Fig. 1. Analysis of pain during active movements according to the visual analog scale (VAS) during THA

For results scales The Harris Hip Score indicators were unsatisfactory and amounted to 30.05 ±4.51 points in the BG and 30.73 ±4.74 points in the CG before the physical therapy program, the results obtained in the two groups were at the level (p>0 .01), which is associated with significant functional limitations, pronounced pain sensations, the use of crutches for walking short distances (by 12 people), since in 10 (26%) patients before THA, a shortening of the limb by 3 cm was found, in 7 (18%) by 5 cm and 11 (30%) by 1 cm (Fig. 2).

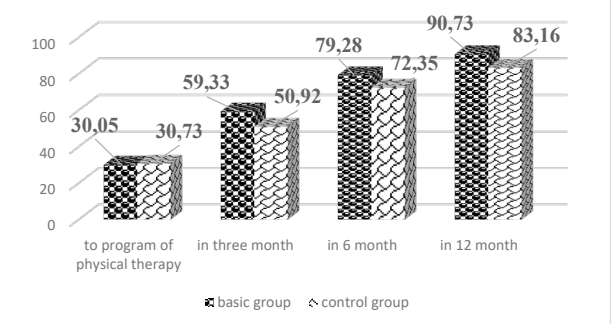

Fig. 2. Results of assessment of the functioning of the hip joint according to the scale Harris Hip Score

Table 2

Dynamics of indicators of the 6-minute gait test

Groups	Periods			
	To the physical therapy program	In 3 months	After 6 months	After 12 months
Basic group	211±12.08 m	344±16.41 m	428±19.33 m	512±22.23 m
Control group	212±13.26 m	289±12.56 m	345±14.52 m	405±16.19 m
	($p<0.01$)			

The indicators of the 6-minute gait test were two times lower than the norm before the TEX, which was associated with the long-term illness of the majority of people and existing functional disorders (Table 2).

Thus, the analysis of the obtained results indicates a significant improvement in functional indicators according to the Harris Hip Score, the Trendelenburg test was negative in 16 BG people, unlike the CG, which remained positive in 12 CG people after 12 months of the physical therapy program. The study showed that a comprehensive program of physical therapy for TEKS contributed to the improvement of hip adductor strength and mobility.

Discussion. After conducting an analysis of the professional literature, we found out that most scientists pay attention to the short-term recovery program in the physical therapy of patients with THA and focus on the acute and post-acute periods.

The authors K.J. Konnyu, L.M. Thoma, M.R. Bhuma in their scientific article cite violations that are characteristic of people elderly with THA, manifested in a violation of static and dynamic coordination, an increase in the risk of falling during movement after 1–2 years, increased pain sensations, of a myofascial nature, which they associate with the lack of rehabilitation in the later period, but do not indicate measures , which must be taken for their prevention (Konnyu et al., 2021).

In his program, the author (Houdek et al., 2014) suggests that therapeutic exercises at the first stages of rehabilitation are not enough to completely restore muscle function and postural stability, and that they should be continued for a longer period of time. An important aspect is the performance of therapeutic exercises, not only for strength and restoration of function in the hip joint, but also for balance and improvement of coordination, especially with the elderly, who have a high risk of falling, which can provoke a subsequent fracture of the femoral neck and dislocation of the endoprosthesis.

According L. Pijnenburg, R. Felten (Pijnenburg et al., 2020) after THA, balance and pro-prioception disorders tend to remain constant, limiting patients' functionality and causing them to move differently, have problems with walking and postural control; therefore, balance and proprioception training is considered an important aspect of rehabilitation in their recovery. Many patients are limited in performing active strengthening, range-of-motion, range-of-motion, or dynamic exercises in the early stages after THA due to surgical precautions, but in the long term these limitations are lifted and allow the elderly to engage in therapeutic exercise.

According to the author, physio-therapeutic interventions should be present before surgery, on the day of surgery and in the postoperative period (Gilbey et al., 2003). However, due to the lack of control by the multidisciplinary team, experiencing improvement in the reduction of pronounced complications that existed before endoprosthetics, patients stop following the instructions and stop engaging in rehabilitation activities. In his program, he lists many types of sports that are recommended for the long-term period after THA for the elderly: golf, basketball, curling, but in our country, most of the listed types are limited.

In the available literature, there is currently no systematic rehabilitation program for the elderly after THA, which will include not only therapeutic exercises, therapeutic massage, physiotherapy, but also other modern means and methods.

Thus, the proposed comprehensive program of physical therapy for the elderly after THA contributed to the improvement of functional indicators in the hip joint according to the Harris Hip Score, walking speed according to the 6-minute test, and a decrease in pain according to the visual analogue scale of pain.

Conclusions

A comprehensive physical therapy program for the elderly patient with THA, developed and applied in clinical conditions, using therapeutic exercises, lymphatic drainage massage, kinesiotherapy, and mechanotherapy, contributed to the improvement of functional indicators according to the Harris Hip Score in the BG after 12 months and produced an excellent result (90.72 points), and a good result in the CG (83.16 points), which indicates the effectiveness of the developed program.

Prospects for further research. Development of a long-term physical therapy algorithm for patients after total hip arthroplasty.

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BIBLIOGRAPHY

Domínguez-Navarro F. et al. Effects of balance and proprioceptive training on total hip and knee replacement rehabilitation: A systematic review and meta-analysis. *Gait & Posture*. 2018. Vol. 62. P. 68–74. https://doi.org/10.1016/j.gaitpost.2018.03.003.

Gilbey H.J. et al. Exercise Improves Early Functional Recovery After Total Hip Arthroplasty. *Clinical Orthopaedics and Related Research*. 2003. Vol. 408. P. 193–200. DOI: 10.1016/s0140-6736(18)31777-x.

Ferguson R.J. et al. Hip replacement. *The Lancet*. 2018. Vol. 392. No. 10158. P. 1662–1671. DOI: 10.1097/00003086-200303000-00025.

Ha W.-B. et al. A Rehabilitation for Total Hip Replacement in Korean Medicine: A Report of Three Cases. *Journal of Korean Medicine Rehabilitation*. 2016. Vol. 26. No. 3. P. 153–164. DOI: 10.18325/jkmr.2016.26.3.153.

Houdek M.T. et al. Stem cell treatment for avascular necrosis of the femoral head: current perspectives. *Stem Cells and Cloning: Advances and Applications*. 2014. P. 65. DOI: 10.2147/SCCAA.S36584.

Konnyu K.J. et al. Prehabilitation and Rehabilitation for Major Joint Replacement. Agency for Healthcare Research and Quality (AHRQ), 2021. DOI: 10.23970/AHRQEPCCER248.

Omeragić V.Z. et al. Effects of physical therapy in patients with total hip joint endoprosthesis. *European Journal of Biomedical*. 2019. Vol. 6(12). P. 111–115.

Pederson G. Physical Therapy Management for a Patient Over 100 Years Old Status Post Total Hip Arthroplasty: A Case Report (Doctoral dissertation, University of Iowa). URL: https://iro.uiowa.edu/esploro/outputs/9984560252502771.

Pijnenburg L., Felten R., Javier R.M. A review of avascular necrosis, of the hip and beyond. *Rev Med Interne.* 2020. Vol. 41. P. 27–36. DOI: 10.1016/j.revmed.2019.10.332.

Skalski M., Gągała J., Socha-Kania M. The need to personalize the rehabilitation process of patients after hip arthroplasty. *Chirurgia Narządów Ruchu i Ortopedia Polska*. 2019. Vol. 84, No. 5. P. 126–131. DOI: 10.31139/chnriop.2019.84.5.26.

Zlatičanin R., Jaganjac A., Kraljević B. Physiotherapy in the rehabilitation of persons after installation of hip endoprosthesis. *Knowledge-International Journal*. 2024. Vol. 64(4). P. 485–91. DOI: 10.5114/areh.2018.76987

REFERENCES

Domínguez-Navarro, F., Igual-Camacho, C., Silvestre-Muñoz, A., Roig-Casasús, S., & Blasco, J.M. (2018). Effects of balance and proprioceptive training on total hip and knee replacement rehabilitation: a systematic review and meta-analysis. *Gait & posture*, *62*, 68–74. DOI: 10.1016/j.gaitpost.2018.03.003.

Ferguson, R.J., Palmer, A.J., Taylor, A., Porter, M.L., Malchau, H., & Glyn-Jones, S. (2018). Hip replacement. *The Lancet*, *392*(10158), 1662–1671. DOI: 10.1016/s0140-6736(18)31777-x.

Gilbey, H.J., Ackland, T.R., Wang, A.W., Morton, A.R., Trouchet, T., & Tapper, J. (2003). Exercise improves early functional recovery after total hip arthroplasty. *Clinical Orthopaedics and Related Research®*, *408*, 193–200. DOI: 10.1097/00003086-200303000-00025.

Ha, W.B., Lee, J.H., Ko, Y.S., & Lee, J.H. (2016). A rehabilitation for total hip replacement in Korean medicine: a report of three cases. *Journal of Korean Medicine Rehabilitation*, *26*(3), 153–164. DOI: 10.18325/jkmr.2016.26.3.153.

Houdek, M.T., Wyles, C.C., Martin, J.R., & Sierra, R.J. (2014). Stem cell treatment for avascular necrosis of the femoral head: current perspectives. *Stem cells and cloning: advances and applications*, 65–70. DOI: 10.2147/SCCAA.S36584.

Konnyu, K.J., Thoma, L. M., Bhuma, M.R., Cao, W., Adam, G.P., Mehta, S., ... & Balk, E.M. (2021). Prehabilitation and rehabilitation for major joint replacement. DOI: 10.23970/AHRQEPCCER248.

Omeragić, V.Z., Tanović, E., Avdić, D., Omerović, Đ., Jaganjac, A., Konjo, H., ... & Talić-Tanović, A. (2019). Effects of physical therapy in patients with total hip joint endoprosthesis. *European Journal of Biomedical*, *6*(12), 111–115.

Pederson, G. (2022). *Physical Therapy Management for a Patient Over 100 Years Old Status Post Total Hip Arthroplasty: A Case Report* (Doctoral dissertation, University of Iowa).

Pijnenburg, L., Felten, R., & Javier, R.M. (2019). A review of avascular necrosis, of the hip and beyond. *La Revue de Médecine Interne*, *41*(1), 27–36. DOI: 10.1016/j.revmed.2019.10.332.

Skalski, M., Gągała, J., & Socha-Kania, M. (2019). The need to personalize the rehabilitation process of patients after hip arthroplasty. *Chirurgia Narządów Ruchu i Ortopedia Polska-Polish Orthopaedics*, *84*(5), 126–131. DOI: 10.31139/chnriop.2019.84.5.26 [in Polish].

Zlatičanin, R., Jaganjac, A., & Kraljević, B. (2024). Physiotherapy in the rehabilitation of persons after installation of hip endoprosthesis. *KNOWLEDGE–International Journal*, *64*(4), 485–491. DOI: 10.5114/areh.2018.76987.

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