

The strategical frameworks of the physical rehabilitation in surgical treatment of the patients with low back pain

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Annotation:

Aim of work was to develop strategic foundations of physical rehabilitation in the surgical treatment of patients with lumbar and sacral vertebragenic compression syndromes. **Methods** are applied in our research: analysis of literature and theoretical research methods (analysis, interpretation and synthesis) of scientific and manual literature on the study. Abstraction (or idealization, or schematization) is an allocation of the essential foundations. There was an experimenting with schemes (as a development of their content, check reasonableness and practicality) during the development of concepts, practical models and physical rehabilitation programs. **Materials:** researching performed on the basis of analysis of a medical data of 542 patients, that treated on the base of SO "Institute of Neurosurgery named after acad. A.P. Romodanov NAMS of Ukraine" and rehabilitation department of the SO "Institute of Traumatology and Orthopedics NAMS of Ukraine". **Results:** effectiveness of the surgical treatment depends on the timely, differentiated, adequate application of physical rehabilitation which should be based on the principles of continuity and duration of effects, which requires developing a plan for physical rehabilitation. A plan which developing, should be based on the results of the rehabilitation's diagnosis and including the need for rehabilitation and the rehabilitation prognosis. **Conclusions:** the developed integrated assessment of rehabilitation potential and the need to determine the amount and intensity of physical rehabilitation.

Keywords:

physical rehabilitation, back pain, rehabilitation, diagnosis, prognosis.

Лазарева Олена, Цеслицка Мирослава, Станкевич Блазей, Мушкета Радослав, Прусик Кристоф. Організаційні основи процесу фізичної реабілітації хворих при хірургічному лікуванні вертеброгенної патології. **Мета роботи:** розробка стратегічних основ фізичної реабілітації при хірургічному лікуванні хворих з попереково-крижовими вертеброгенними компресійними синдромами. **Методи дослідження:** аналіз літератури і теоретичні методи дослідження (аналіз, інтерпретація та синтез науково-методичної літератури з проблем дослідження), абстракція (ідеалізація або схематизація), виділення головних основ, експерименти зі схеми (як вивчення їх змісту, перевірка обґрунтованості і практичності). **Матеріали:** дослідження виконано на основі аналізу медичних даних 542 пацієнтів, що знаходилися на лікуванні на базі ДУ «Інститут нейрохірургії імені акад. А.П. Ромоданова НАМН України» та реабілітаційного відділення ДУ «Інститут травматології та ортопедії НАМН України». **Результати:** ефективність хірургічного лікування залежить від своєчасного, диференційованого, адекватного застосування фізичної реабілітації, яка повинна бути заснована на принципах безперервності і тривалості впливу, що вимагає розробки плану фізичної реабілітації. Розроблений план повинен бути заснований згідно реабілітаційного діагнозу і в тому числі необхідності реабілітації і реабілітаційного прогнозу. **Висновки:** розроблена комплексна оцінка реабілітаційного потенціалу і необхідності, щоб визначити якість і інтенсивність фізичної реабілітації.

Лазарева Елена, Цеслицка Мирослава, Станкевич Блазей, Мушкета Радослав, Прусик Кристоф. Организационные основы процесса физической реабилитации больных при хирургическом лечении вертеброгенной патологии. **Цель работы:** разработка стратегических основ физической реабилитации при хирургическом лечении больных с пояснично-крестцовыми вертеброгенными компрессионными синдромами. **Методы исследования:** анализ литературы и теоретические методы исследования (анализ, интерпретация и синтез научно-методической литературы по проблемам исследования), абстракция (идеализация или схематизация), выделение главных основ, эксперименты со схемы (изучение их содержания, проверка обоснованности и практичности). **Материалы:** исследование выполнено на основе анализа медицинских данных 542 пациентов, находившихся на лечении на базе ГУ «Институт нейрохирургии имени акад. А.П. Ромоданова НАМН Украины» и реабилитационного отделения ГУ «Институт травматологии и ортопедии НАМН Украины». **Результаты:** эффективность хирургического лечения зависит от своевременного, дифференцированного, адекватного применения физической реабилитации, которая должна быть основана на принципах непрерывности и длительности воздействия, требует разработки плана физической реабилитации. Разработанный план должен быть основан согласно реабилитационного диагноза и в том числе необходимости реабилитации и реабилитационного прогноза. **Выводы:** разработана комплексная оценка реабилитационного потенциала и необходимости, чтобы определить качество и интенсивность физической реабилитации.

фізична реабілітація, болі в спині, реабілітаційний, діагноз, прогноз.

физическая реабилитация, боли в спине, реабилитационный, диагноз, прогноз.

Introduction.

A back pain (BP) is a common problem in the modern society. By the outlook for a return to work is commonly good in this case, it's nearly from 10 to 25% of patients with BP are absent from work in a long term, so this is the risk for social and financial situation of workers [14]. A lot of these patients have a long history of rehabilitation, including various types of treatment, mainly aimed at the pain alleviating. At the same time, according to Ludeke C Lambek [15], the main goal of rehabilitation is to restore the functioning of the human in private and work life and to decrease a pain.

V.D. Troshin [12], based on a system and cybernetic entity stages of afferent synthesis, decision-making, the formation of the acceptor action of the efferent

synthesis, the formation of action and evaluation of the results achieved by P.K. Anokhin [1] highlights in the rehabilitation of neurological patients six stages, there are:

- assessment of the rehabilitation situation,
- formation of the rehabilitation' diagnosis,
- prognostication of the functional status,
- rehabilitation program construction,
- rehabilitation interaction,
- evaluation of the results.

The concept should be based on a set of systems approaches, that's crucial for the development of integrative and individualized the physical rehabilitation programs and prevention of relapse of the disease.

The effectiveness of surgical treatment certainly extents depend from timely, differentiated, appropriating using of physical rehabilitation and it should be based on the principles of continuity and duration of effects, which

requires the development of a rehabilitation plan [6, 14].

Rehabilitation plan is the algorithm of the rehabilitation process (or necessary actions and its frequency and duration) from the onset to full recovery (compensation functions), compiled by a team of rehabilitation agencies, with the active participation of the patient, based on an objective assessment of the rehabilitation potential of the diagnosis and rehabilitation (fig. 1).

In our opinion, the development of this plan should be based on the results of the rehabilitation diagnosis that includes:

- need for rehabilitation,
- rehabilitation prognosis.

Purpose, tasks of the work, material and methods

Aim of this work was to develop strategic foundations of physical rehabilitation in the surgical treatment of patients with lumbar and sacral vertebrogenic compression syndromes.

Methods are applied in our research: analysis of literature and theoretical research methods (analysis, interpretation and synthesis of scientific and manual literature on the study. Abstraction (or idealization, or schematization) is an allocation of the essential foundations. There was an experimenting with schemes (as a development of their content, check reasonableness and practicality) during the development of concepts, practical models and physical rehabilitation programs.

Researching performed on the basis of analysis of a medical data of 542 patients, that treated on the base of SO “Institute of Neurosurgery named after acad. A.P. Romodanov NAMS of Ukraine” and rehabilitation department of the SO “Institute of Traumatology and Orthopedics NAMS of Ukraine”.

Results of the researches

The features of the motor system pathology in individuals with herniated intervertebral discs require specialized methodical approach in the assessment of compensation of the lost functions and the principles of recovery.

Together with doctor should be formed the neurosurgical diagnosis and defined «rehabilitation diagnosis» and «rehabilitation prognosis». The statement of rehabilitation diagnosis is carried out through: the rehabilitation examination (anamnesic information, inspection and palpation), the studies of intact sensory and motor functions, the results of objective research tool. Examination should be performed by physiotherapist through the general clinical principles, by the form and substance, should be without any differences from a neurological or orthopedic examination, but it has some problems.

The single one, that the neurologist primarily assesses the type of lost (or damage) of any functions on the basis of which articulates the topical (or anatomical) diagnosis. The main objective of the physiotherapist is identification of *the saved* anatomical and functional structures, defini-

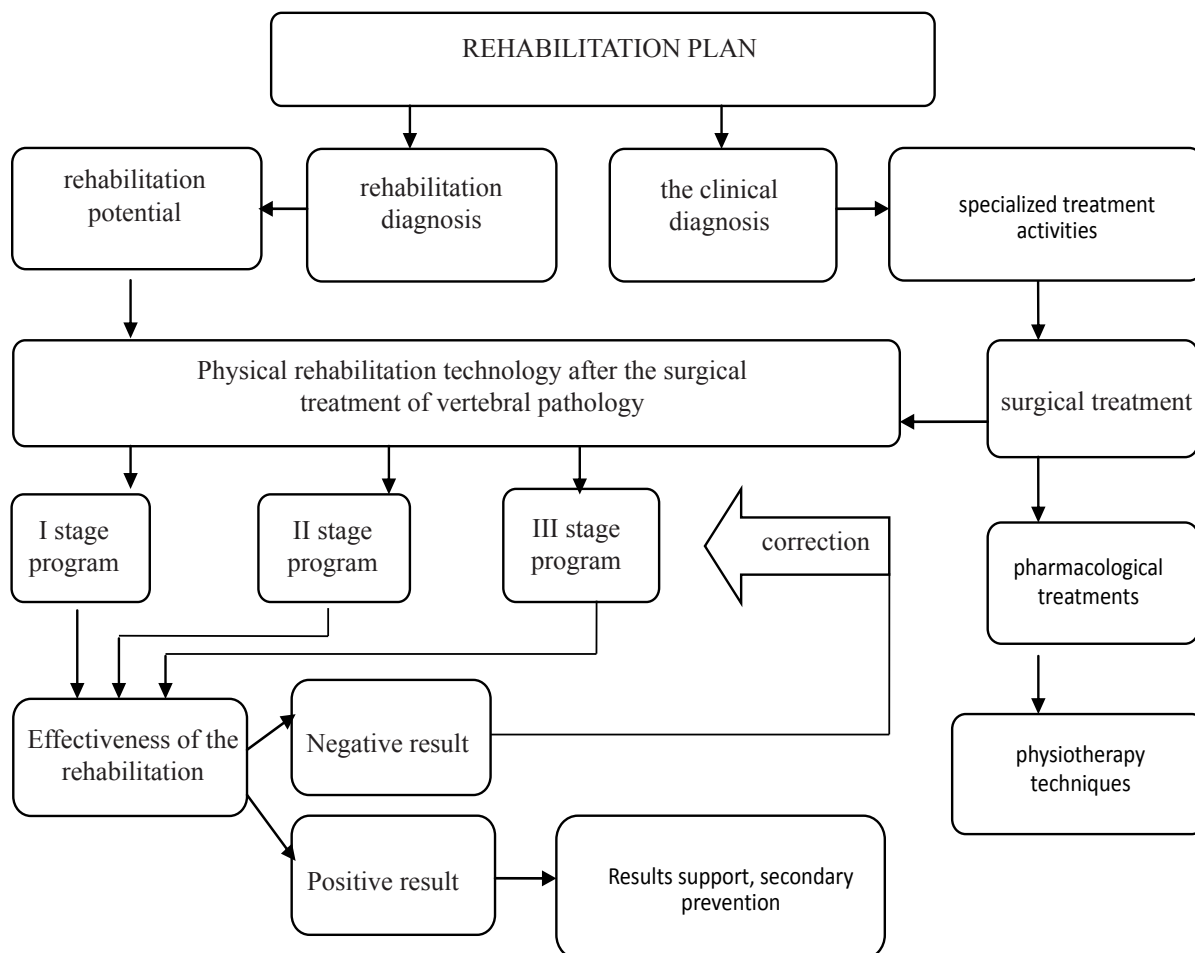


Fig. 1. Strategic framework of the rehabilitation process for patients after the surgical treatment of back pain

tion of the initial level of compensation of lost function and prediction of further recovery.

By the figurative expression of Potekhin L.D. [11], physiotherapist should be identified “no that is what is absent, but what is get.” And as the untapped the anatomical and functional potential of the patient (“what is get”) can not be consciously used in the rehabilitation process, the success of rehabilitation generally determined by the quality inspection of the rehabilitation and action oriented.

The diagnosis of the vertebral lesions in patients referred for surgery of herniated disc removal can get certain difficulties for neurosurgeons and spine specialists. The most frequently in the lumbar spine ascertain defeat on the L4-L5 and L5-S1 levels, it can be with a acute pain and paresis of the lower limbs flaccid. However, under the diagnosis as a “slack paresis of the lower extremities” hides different clinical variants with its combination of fixed and reflex changes with combination of radicular and vascular deposition in the various proportions. Patients with the same level of destruction and the syndromical diagnosis may have different movement possibilities.

The difficult structure of motor defect during the vertebral disease is caused not only by mechanical damage of the nervous tissue, roots and spinal membranes, but also developing transneurological and vascular changes, as well as secondary degenerative processes takes place in the nerve trunks, muscles, skin, internal organs and motor system [6]. The asymmetry of the damages [4], disruption of specific and non-specific afferent inputs, destruction neuromuscular links probably bring to a complex set of sensory and motor defects, the clinical picture is determined by the defeat of one system in combination with the partial safety of others.

In these conditions, according to M. Leontiev [9], physiotherapist should see any other diagnostic problems than neurosurgeon before.

According to the WHO data (World Health Organization, 1980), in all subjects, including neurological, there are three levels of the consequences of disease or injury, are there follows:

The first one is the level of *neurological defect*, as a motor, sensory, tonic, psychological disorders, which can be detected in the clinical examination of the disease in the patient.

The second level is dysfunction (or disability) it can cause neurological damage, as walking disturbances, self-service.

The third level is the outcome level (or handicap) includes the violations of civil and social activities that occur as a result of neurological damage and disorders [8].

In recent years, there is put into practice the concept as a “health-related quality of life”, it means the quality of life, considered as an integral characteristic, which should be guided in evaluating the rehabilitation effectiveness for some patients and disabled [3, 8]. Of course, all of these diseases outcomes are interrelated: damage causes some disability; it brings to a social restrictions and impairment of quality of life [2].

The data that obtained by rehabilitation inspection is the basis for setting the rehabilitation goals, rehabilitation plan and evaluation of results. Thus, the understanding of modern restorative treatment for the disabled patient is not a passive recipient of treatment and there would be an active participation in the process of treatment by the patient, as the main line of treatment for rehabilitation interventions used movement and patient counseling, assistance in the using of aids. This approach provides the most good and long lasting results. The rehabilitation program for patients with motor and functional disorders as a result of vertebral disorders is essential for the successful rehabilitation. Modern rehabilitation measures allow using saved compensatory potential to achieve the greatest possible effect, provided adequate surgical and neurological care.

Rehabilitation need. The first step in the planning is identifying the rehabilitation needs for the people in the form of aid. This requires the understanding of the indications for medical rehabilitation [2]. The common indications for medical rehabilitation are presented in the report of the WHO Expert Committee on Disability Prevention and Rehabilitation [1983]. There are a significant reduction in functional ability, decreased ability to learn, particularly vulnerable to the environmental influences; violations of social relations, breach of employment.

M.V. Bogolyubov [10] draws to the fact that for achieving a full recovery, there is no need for rehabilitation. If the effects of the disease are still hampering the existence (physical or social) of the patients or integrating it into society, there is a need for rehabilitation for this patient. The author emphasizes that if the need arises not when the disease is detected in the course of a disease, the need for this one should be promptly identified and appropriate measures, should be initiated well in advance. Only an objective assessment of functional reserve capacity and the patient’s body carried by a doctor can give adequate information about his professional competence. And there needed further examination, testing a patient for professional suitability.

According to V.A. Isanova [7], there comes the rehabilitation need, if as a result of injury or illness there can be a risk of temporary or prolonged impaired functional ability, there is the threat of prolonged restriction or worsening of the patient under the influence of negative environmental factors.

In this case, a clear answer, which contingents of disabled people in the first place need for the rehabilitation, the literature does not exist. Some scientists believe that the medical rehabilitation should be part of the healing process for all patients at risk of long-term disability, while others believe that the institutions of rehabilitation should be used only for those with very severe injuries, only for people with disabilities [2, 8]. The most reasonable is to assume the point of view that shows the rehabilitation of those patients who have the disease due to a high risk of persistent reduction of social and consumer activity has already formed or disability [2].

In our country, at this moment, there is an insufficient number of rehabilitation facilities with limited bandwidth. Therefore, the main line becomes urgent to prioritize the provision of rehabilitative care to patients with certain forms of diseases.

The integrated assessment of the rehabilitation need for patients with vertebral pathology aimed at surgical treatment and consisted from the following criteria: as the presence of paresis of the lower extremities, the presence of spinal deformity, the presence of sub-optimal dynamic stereotype, the presence of pain in the spine and / or lower extremities, lower social mobility household identified changes after surgery and the postoperative period. The scale was made on the basis of a five-point evaluation scale of vertebral symptoms. For each parameter is assigned a certain number of points - from 1 to 5. The total score determines the level of rehabilitation needed.

About the definition of "rehabilitation potential" term there are different points of view. If V.A. Isanova [7] thinks that under the rehabilitation potential implied a stable physical and mental condition of rehabilitant, his high motivation towards the upcoming rehabilitation treatment, V.M. Dornichev [5] considers the patient's rehabilitation potential is the scientifically founded line that limits the possible recovery of scarce (disturbed) physiological functions in specific clinical case. Relying on the definition by V.M. Dornichev [5], as applied to patients with vertebral pathology going to surgery, we identified factors and levels that determine rehabilitation potential in this case of patients.

Rehabilitation prognosis is a reasonable likelihood of achieving the goals of rehabilitation in a certain period of time, given the nature of the disease, its course, individual resources and compensatory capacities of the patient, the presence of sufficient rehabilitation potential. Rehabilitation prognosis for each patient was determined on the basis of an integrated assessment of rehabilitation potential and necessity. Based on the rehabilitation need, rehabilitation potential, rehabilitation prognosis and the objective of the research that include clinical neurological examination, functional impairment and quality of life for each patient was put the rehabilitation diagnosis that determines further care rehabilitation.

We have developed a system of assessment of rehabilitation potential and the need for permits, firstly, for determining the amount and intensity of physical rehabilitation activities, and secondly, during the monitoring conducted to identify the adequacy of rehabilitation. The more emphasized motor deficit level billows locomotion, the less opportunity to choose recovery procedures, both because of complexity of the process and due to the characteristics of rehabilitation effect on the patient's rehabilitation low prognosis.

Conclusions.

The level of movement disorders, spinal deformity, the level of pain and of social constraints significantly affects both the level of health of the patients during the surgical treatment of vertebral pathologies, and the choice of the rehabilitation means for these patients, that requires the development of an objective measure of the integral rehabilitation prognosis.

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