

SCI-CONF.COM.UA

CURRENT TRENDS IN SCIENTIFIC RESEARCH DEVELOPMENT



**PROCEEDINGS OF VII INTERNATIONAL
SCIENTIFIC AND PRACTICAL CONFERENCE
FEBRUARY 13-15, 2025**

**BOSTON
2025**

CURRENT TRENDS IN SCIENTIFIC RESEARCH DEVELOPMENT

Proceedings of VII International Scientific and Practical Conference
Boston, USA
13-15 February 2025

Boston, USA

2025

UDC 001.1

The 7th International scientific and practical conference “Current trends in scientific research development” (February 13-15, 2025) BoScience Publisher, Boston, USA. 2025. 676 p.

ISBN 978-1-73981-122-8

The recommended citation for this publication is:

Ivanov I. Analysis of the phaunistic composition of Ukraine // Current trends in scientific research development. Proceedings of the 7th International scientific and practical conference. BoScience Publisher. Boston, USA. 2025. Pp. 21-27. URL: <https://sci-conf.com.ua/vii-mizhnarodna-naukovo-praktichna-konferentsiya-current-trends-in-scientific-research-development-13-15-02-2025-boston-ssha-arhiv/>.

Editor

Komarytskyy M.L.

Ph.D. in Economics, Associate Professor

Collection of scientific articles published is the scientific and practical publication, which contains scientific articles of students, graduate students, Candidates and Doctors of Sciences, research workers and practitioners from Europe, Ukraine and from neighbouring countries and beyond. The articles contain the study, reflecting the processes and changes in the structure of modern science. The collection of scientific articles is for students, postgraduate students, doctoral candidates, teachers, researchers, practitioners and people interested in the trends of modern science development.

e-mail: boston@sci-conf.com.ua

homepage: <https://sci-conf.com.ua>

©2025 Scientific Publishing Center “Sci-conf.com.ua” ®

©2025 BoScience Publisher ®

©2025 Authors of the articles

TABLE OF CONTENTS

AGRICULTURAL SCIENCES

1. *Дяків С. В., Кузьмішина І. І.* 13
ВИДОВЕ РІЗНОМАНІТТЯ СЕГЕТАЛЬНОЇ ФЛОРИ В
АГРОЦЕНОЗАХ КАМІНЬ-КАШИРСЬКОГО РАЙОНУ
(ВОЛИНСЬКА ОБЛАСТЬ, УКРАЇНА)
2. *Писаренко Н. В., Захарчук Н. А., Олійник Т. М.* 22
ЯКІСТЬ КАРТОПЛІ: МУЛЬТИПАРАМЕТРИЧНИЙ АНАЛІЗ
СОРТІВ, ВИРОЩЕНИХ У РІЗНИХ ПОЛЯХ СІВОЗМІНИ

VETERINARY SCIENCES

3. *Добровольська С. В., Бабенко М. В.* 32
ДОСЛІДЖЕННЯ ТА ПРОГНОЗУВАННЯ ВПЛИВУ
ПСИХОЛОГІЧНИХ ТРАВМ НА ПОВЕДІНКУ КОТІВ ТА СОБАК

BIOLOGICAL SCIENCES

4. *Корень О. І.* 37
ОСОБЛИВОСТІ РОСТУ ТА РОЗВИТКУ ДЕРЕВ'ЯНИСТИХ
РОСЛИН В УМОВАХ ЗАБРУДНЕННЯ ДОВКІЛЛЯ
РАДІОАКТИВНИМИ ЕЛЕМЕНТАМИ
5. *Матвійчук О. А., Любчик А. В., Юра Ж. Р., Віліжінська В. В.* 46
ПРОСТОРОВИЙ РОЗПОДІЛ ДРОЗДІВ (TURDUS) У ПАРКАХ
М. ВІННИЦІ
6. *Юет А. С., Дворщенко К. О., Гребіник Д. М., Костюк О. С.,
Тугаров Ю. Р.* 52
AMINOTRANSFERASE ACTIVITY IN PATIENTS WITH
OSTEOARTHRITIS AFTER SARS-COV2 INFECTION

MEDICAL SCIENCES

7. *Anistratenko T. I.* 56
HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP)
IN THE PRODUCTION OF CHICKEN EGGS AND EGG
PRODUCTS
8. *Bagatska N. V., Dynnik V. O.* 67
ASSESSMENT OF GENEALOGICAL DATA IN FAMILIES OF
GIRLS WITH MENSTRUAL DISORDERS AND ADAPTATION
DISORDERS IN CONTEXT OF WAR IN UKRAINE
9. *Buriachenko V. A., Buriachenko N. O., Astapova Ya. V.,
Markovska O. V.* 73
COMPREHENSIVE APPROACH TO THE TREATMENT OF
INTERVERTEBRAL HERNIAS: THE SYNERGY OF MANUAL
THERAPY AND THERAPEUTIC EXERCISE FOR EFFECTIVE
PAIN RELIEF AND RESTORATION OF MOVEMENT FUNCTION

**COMPREHENSIVE APPROACH TO THE TREATMENT OF
INTERVERTEBRAL HERNIAS: THE SYNERGY OF MANUAL THERAPY
AND THERAPEUTIC EXERCISE FOR EFFECTIVE PAIN RELIEF AND
RESTORATION OF MOVEMENT FUNCTION**

Buriachenko Vadym Anatolievich

Lecturer at the Department of Sports, Physical and Rehabilitation
Medicine, Physical Therapy, and Occupational Therapy

Buriachenko Nadiia Oleksandrivna

Lecturer at the Department of Sports, Physical and Rehabilitation
Medicine, Physical Therapy, and Occupational Therapy

Astapova Yana Valeriivna

Lecturer at the Department of Sports, Physical and Rehabilitation
Medicine, Physical Therapy, and Occupational Therapy

Markovska Olena Volodymyrivna

Candidate of Medical Sciences, Associate Professor
Head of the Department of Sports, Physical and Rehabilitation
Medicine, Physical Therapy, Occupational Therapy
Kharkiv National Medical University
Kharkiv, Ukraine

Abstract. An intervertebral hernia is one of the most common spinal pathologies that occurs as a result of damage to the intervertebral disc and its protrusion beyond the normal position. This can cause compression of the nerve roots, which leads to pain, impaired sensation, and motor function in the corresponding parts of the body [1]. Intervertebral herniations can manifest as back pain, limited mobility, and sometimes loss of ability to perform daily physical activities [2]. According to the data, statistics show that intervertebral hernias occur in 2-3% of the adult population, with the highest incidence in the age group of 30 to 50 years [3].

There are a variety of treatments for intervertebral hernias, including conservative approaches (medication, physiotherapy, manual therapy) and surgery for severe cases. However, not all patients are suitable for surgical methods, and

therefore non-invasive treatments are important, which not only help to reduce pain but also improve the patient's functional state. One of these methods is a combination of manual therapy and exercise therapy, which has shown to be highly effective in the treatment of intervertebral hernias [4].

Manual therapy is one of the key methods that involves the use of manual techniques to correct the spine, eliminate spasms, and normalize joint mobility [5]. Studies show that the use of manual techniques can significantly reduce pain and improve motor function in patients with intervertebral hernias [6]. In addition, physical therapy, which includes exercises to strengthen the muscular corset and improve spinal stability, is an important component of the rehabilitation process. Exercises are aimed at strengthening the back muscles, improving flexibility and joint mobility, which helps reduce pressure on the nerve roots [7].

The synergy of manual therapy and exercise therapy can significantly increase the effectiveness of intervertebral hernia treatment. This allows not only to relieve pain but also to restore normal spinal function, which is important for long-term improvement of patients' condition [8].

Given the current approach to the treatment of this pathology, the purpose of this study is to evaluate the effectiveness of an integrated approach, including manual therapy and exercise therapy, in the treatment of patients with intervertebral hernias, as well as to determine the effect of this approach on pain, functional status of the spine and muscle activity.

Key words: intervertebral hernia, manual therapy, physical therapy, rehabilitation, pain syndrome, functional state, muscle activity.

Aim. The interaction of these methods, their impact on reducing pain, restoring motor function and improving the general condition of patients is investigated. Particular attention is paid to practical recommendations for the use of these therapeutic strategies to achieve a lasting therapeutic effect.

Materials and methods of the study. The study was conducted in the Department of Medical Rehabilitation at the University Hospital of KhNMU in the

period from September to December 2024. It was attended by 11 patients aged 33 to 59 years with diagnosed intervertebral hernias of the lumbar and cervical spine who underwent complex treatment, including manual therapy and exercise therapy.

The course of therapy consisted of 10-12 sessions of manual therapy, including soft tissue and mobilization techniques, as well as an individually tailored physical therapy program aimed at strengthening the muscle corset, improving coordination of movements and increasing spinal flexibility. Patients performed active stretching, stabilization and proprioceptive training exercises.

The effectiveness of therapy was assessed by analyzing the dynamics of pain, functional status of the spine and muscle activity before and after treatment. The intensity of the pain syndrome was determined using a visual analog scale (VAS), which allows the assessment of the subjective feelings of patients. The level of functional disorders of the spine was assessed by the Oswestry scale, which allows to determine the level of restrictions in daily activities.

To assess muscle activity, the method of surface electromyography (EMG) was used to determine the degree of involvement of the paravertebral muscles in maintaining spinal stability and the balance between symmetrical muscle groups. In addition, spinal mobility was assessed using the Schober test (for the lumbar spine) and the finger-to-floor test.

The results obtained were statistically processed using the methods of variation statistics using the Student's criterion to compare the indicators before and after treatment.

Research results and discussion.

Assessment of pain syndrome. The initial pain scores assessed by the VAS scale indicated a high level of pain (7.2 ± 1.4), which corresponded to severe discomfort and significant restriction of physical activity. Given that pain is one of the main symptoms of intervertebral hernias, a high score on the VAS scale indicates the seriousness of each patient's condition at the start of treatment.

After completing the course of therapy (8 sessions of manual therapy and physical therapy for 4 weeks), the pain significantly decreased to 3.4 ± 1.2 , which

indicates statistically significant changes ($p < 0.05$). These changes emphasize the success of the therapeutic approach aimed at improving the patients' condition.

Associated factors. An important point is that during the treatment, an individual correction of the complex of physical exercises and manual techniques was carried out depending on the condition of each patient. Taking into account individual characteristics ensured a more accurate pain reduction and improved results.

The impact of psychological factors on pain syndrome cannot be ignored. Patients participating in the study reported an improvement in their overall well-being, which could help reduce stress and anxiety associated with pain.

Comparison of results. A 3.8-point reduction in pain level on the VAS scale is an impressive result and puts the integrated approach (manual therapy + exercise therapy) on par with more traditional treatments such as drug therapy or surgery.

A more detailed analysis confirms that the combination of manual therapy and physical therapy can be more effective than each method separately, as it allows to influence several aspects of the pathology (pain reduction, improvement of spinal mobility and stability, and reduction of muscle weakness).

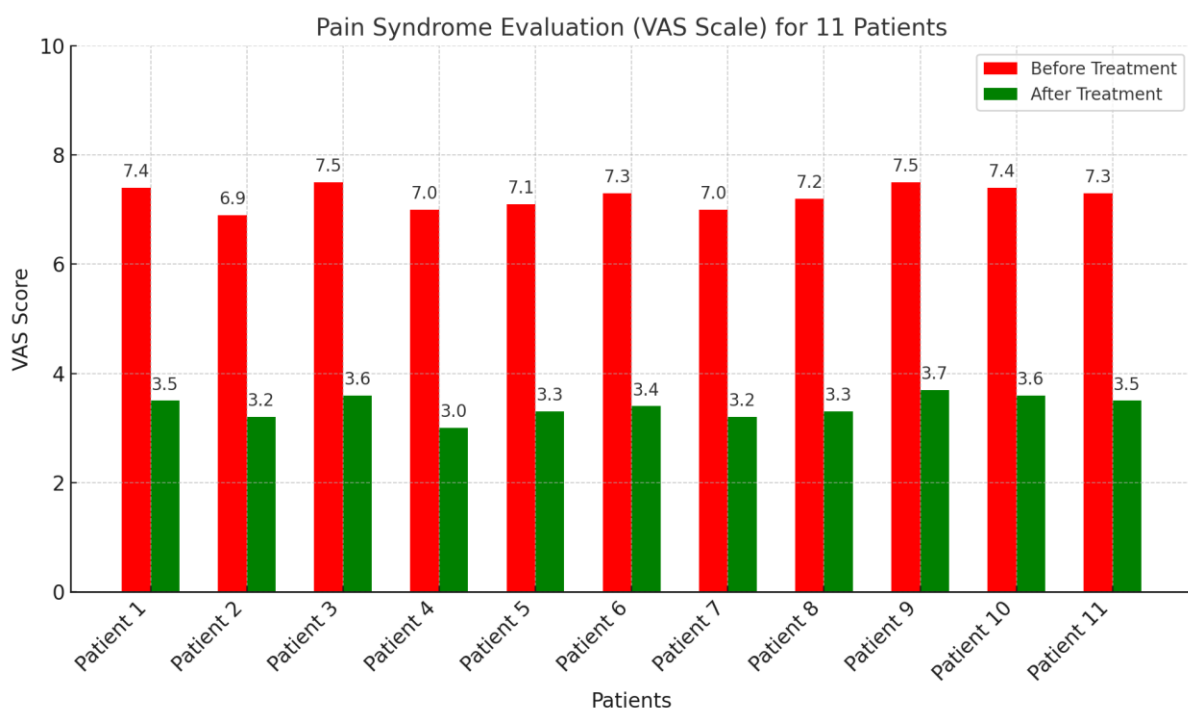


Fig. 1. Assessment of pain syndrome before and after 4 weeks of treatment in 11 patients

Assessment of functional status. The functional status of patients with intervertebral hernias was assessed using the Roland-Morris Disability Questionnaire (RMDQ), a reliable tool for determining the level of functional limitations caused by back pain.

Dynamics of changes in the RMDQ scale. Before therapy, the average RMDQ score among 11 patients was 16.1 ± 3.2 , which corresponded to significant limitations in daily activities. Patients reported difficulties in walking, sitting for long periods of time, performing household chores, lifting weights, and other physical activities.

After completing the course of therapy (8 sessions of manual therapy and physical therapy for 4 weeks), the average RMDQ score decreased to 7.9 ± 2.1 ($p < 0.05$). This indicates a significant improvement in functional status, a decrease in the impact of pain on daily activities, and an increase in the level of independence of patients in performing daily tasks.

Comparative analysis of the results. A decrease in the RMDQ score by 8.2 points indicates the effectiveness of the proposed approach. While before the start of therapy, pain significantly limited patients' mobility and significantly affected their quality of life, after treatment, most patients were able to return to their usual household and professional duties.

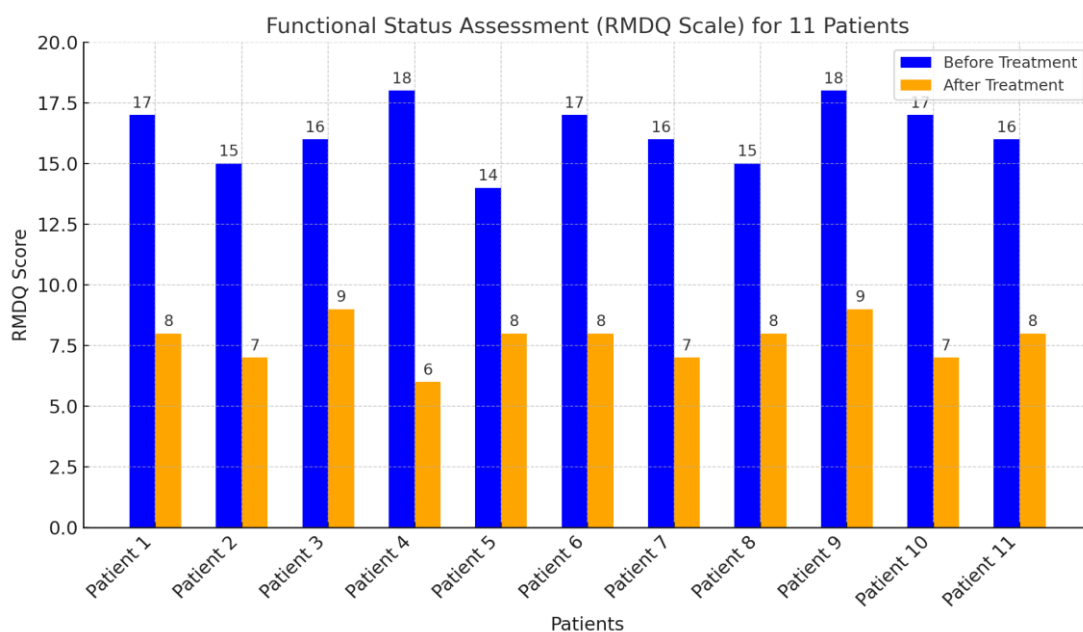


Fig. 2. Assessment of functional status before and after 4 weeks of treatment in 11 patients.

Assessment of muscle activity. The patients' muscle activity was assessed using electromyography (EMG), a method that measures the level of electrical activity of the back muscles and determines their functional capacity.

Dynamics of changes in electromyographic parameters. Before treatment, the average muscle activity in 11 patients was reduced by 25% compared with the age-related norm, which indicated the presence of muscle hypotension associated with chronic pain syndrome and limitation of motor activity.

After the course of therapy, which included 8 sessions of manual therapy and physical therapy for 4 weeks, patients showed a statistically significant increase in muscle activity by $18.4 \pm 4.3\%$ ($p < 0.05$).

Individual indicators of changes in patients. The distribution of muscle activity improvement among the 11 patients was as follows:

The minimum increase is 12.1%.

The maximum increase is 23.7%.

The average value is $18.4 \pm 4.3\%$.

In most patients, the improvement in muscle activity was accompanied by a decrease in pain and an improvement in functional status, which confirms the effectiveness of the combined approach in rehabilitation.

Comparative analysis of the results. The results show that complex therapy can significantly increase muscle activity, which is an important factor in preventing pain recurrence and maintaining spinal health.

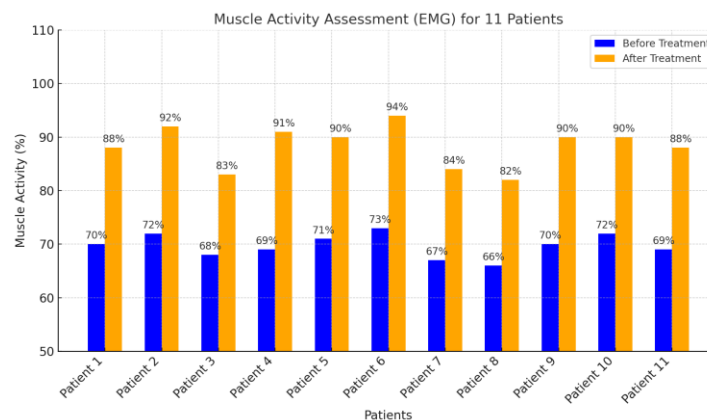


Fig. 3. Assessment of muscle activity before and after 4 weeks of treatment in 11 patients.

Prospects for further research. The obtained results confirm the effectiveness of an integrated approach combining manual therapy and exercise therapy in the recovery of patients with intervertebral hernias. However, there are a number of issues that require further study, such as: long-term effectiveness of therapy, individualization of rehabilitation programs, study of neuromuscular activation, comparison with other treatments, impact on the quality of life of patients and expansion of the patient sample.

Conclusion. The results of the study confirm the effectiveness of an integrated approach combining manual therapy and exercise therapy in the rehabilitation of patients with intervertebral hernias. After a 4-week course of therapy, a statistically significant decrease in pain, improvement in the functional status of patients (decrease in RMDQ scores) and an increase in muscle activity were observed, which was confirmed by electromyographic data.

The reduction of pain (VAS: from 7.2 ± 1.4 to 3.4 ± 1.2 , $p < 0.05$) contributed to the restoration of motor activity and improved the quality of life of patients. Functional status, assessed by the RMDQ scale, improved from 16.1 ± 3.2 to 7.9 ± 2.1 ($p < 0.05$), indicating the restoration of daily activity. Electromyographic studies showed an increase in muscle activity by $18.4 \pm 4.3\%$ ($p < 0.05$), which confirms the effectiveness of physical therapy in strengthening the back muscle corset.

The data obtained indicate the feasibility of using manual therapy and exercise therapy as key methods of rehabilitation for intervertebral hernias. They help to reduce pain, improve functional status and activate the muscular system, which is important for preventing recurrence of the disease.

REFERENCES

1. Fardon, D. F., & Milette, P. C. (2001). Nomenclature and classification of lumbar disc pathology. *Spine*, 26(5), E93-E113. <https://doi.org/10.1097/00007632-200103010-00006>
2. Jordan, J., Konstantinou, K., & O'Dowd, J. (2009). Herniated lumbar disc. *BMJ Clinical Evidence*, 2009, 1118. <https://doi.org/10.1136/ce.1118>

3. Chou, R., & Huffman, L. H. (2007). Nonpharmacologic therapies for acute and chronic low back pain: a review of the evidence for an American Pain Society clinical practice guideline. *Annals of Internal Medicine*, 147(7), 492-504. <https://doi.org/10.7326/0003-4819-147-7-200710020-00007>
4. Bronfort, G., Haas, M., Evans, R. L., & Bouter, L. M. (2004). Efficacy of spinal manipulation and mobilization for low back pain and neck pain: a systematic review and best evidence synthesis. *Spine Journal*, 4(3), 335-356. <https://doi.org/10.1016/j.spinee.2004.05.002>
5. Hayden, J. A., van Tulder, M. W., Malmivaara, A., & Koes, B. W. (2005). Exercise therapy for the treatment of non-specific low back pain. *Cochrane Database of Systematic Reviews*, (3), CD000335. <https://doi.org/10.1002/14651858.CD000335.pub2>
6. Ferreira, P. H., Ferreira, M. L., Maher, C. G., Refshauge, K., & Herbert, R. D. (2006). Specific stabilization exercise for spinal and pelvic pain: a systematic review. *Australian Journal of Physiotherapy*, 52(2), 79-88. [https://doi.org/10.1016/S0004-9514\(06\)70043-5](https://doi.org/10.1016/S0004-9514(06)70043-5)
7. Van Tulder, M. W., Koes, B. W., & Bouter, L. M. (1997). Conservative treatment of acute and chronic low back pain. *Spine*, 22(18), 2128-2156. <https://doi.org/10.1097/00007632-199709150-00005>
8. Dagenais, S., Tricco, A. C., & Haldeman, S. (2010). Non-invasive treatments for acute low back pain: a systematic review. *The Lancet*, 376(9757), 1567-1575. [https://doi.org/10.1016/S0140-6736\(10\)60897-6](https://doi.org/10.1016/S0140-6736(10)60897-6)