*Personalized Psychiatry and Neurology*

*Review*

# Application of Patient-Reported Outcomes in Back Pain in Adults: Part 2

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**Abstract:** The aim of the research is generalization of information about the most common foreign and domestic scales and questionnaires used in acute and chronic back pain (BP). The analysis of Russian-language and foreign literature was carried out with a search depth of 5 years (2016–2021) in the following databases: e-Library, PubMed, Oxford Press, Clinical Keys, Springer, Elsevier, Google Scholar. To diagnose back pain and assess the characteristics of its course in dynamics, both a standardized study is used: collection of complaints, anamnesis, objective examination, assessment of neurological status, as well as valid PRO. For timely diagnosis and monitoring of the development of BP in patients with osteochondrosis of the spine, a wide range of scales and questionnaires were proposed, which we ranged into 4 groups: scales for assessing the quality of life of patients with BP; scales for assessing the characteristics of pain in BP; scales for assessing disease outcomes in BP; scales for assessing disability in BP. The second part of the thematic review presents an analysis of the advantages and disadvantages of scales for assessing pain characteristics, disease outcome and disability in patients with BP. Patient-reported outcomes assessment tools for patients with BP are popular in the world medical practice, however, it is necessary to adapt to the use in domestic clinical practice of such scales as Pain Quality Assessment Scale and Pain Quality Assessment Scale Revised (PQAS and PQAS-R), The Patient Assessment for Low Back Pain - Symptoms (PAL-S), Orebro Musculoskeletal Pain Questionnaire (OMPQ).

***Keywords:*** *patient-reported outcomes; back pain; scale; questionnaire.*

## Introduction

Back pain (BP) is one of the most important problems in clinical medicine due to the high prevalence of this pathological condition. In the course of BP, acute (lasting less than 6 weeks), subacute (from 6 to 12 weeks) and chronic (more than 12 weeks) forms are distinguished. Chronic BP, in turn, is classified as recurrent (occurs at least 1 month after the previous pain episode has subsided) and persistent [1]. Such systematization makes it possible to choose the optimal algorithm for managing a particular patient with BP [2]. In most cases, BP is acute, lasts several days, and is well relieved at the outpatient stage with nonsteroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants. In 30% of patients, BP persists for 6 weeks (persistent pain) [3].

Chronic BP causes the patient to develop anxiety and depressive disorders, "pain behavior" is gradually formed, the perception of pain changes, fear, a feeling of expectation of pain, and irritability appear. There are known factors that can aggravate the course of BP: anxiety and depressive disorders, the patient's desire for social protection. The

transformation of acute BP into chronic requires a different approach to managing the patient [4].

In recent years, chronic BP has received much attention both in domestic [5,6,7,8] and foreign [9,10,11,12] literature. The urgency of the problem is due not only to medical, but also to social factors. It is known that in 10–20% of patients of working age, acute BP is transformed into a chronic one. This group of patients is characterized by an unfavorable prognosis for recovery, and it accounts for up to 80% of all healthcare costs for the treatment of BP [13]. Chronic BP with a neuropathic component is more commonly associated with severe pain, decreased quality of life, and overall high healthcare costs compared to non-neuropathic BP. According to the results of the Russian epidemiological study, it was found that the occurrence of the neuropathic component of pain is noted in 35% of patients with BP [14].

Patient-reported outcomes (PRO) using standardized scales and questionnaires to be filled in has become a daily practice for clinical studies in many spinal surgery centers in Europe and a number of clinics in Russia in patients with BP [15].

By definition, PRO is an assessment of any aspect of a patient's health that comes directly from the patient without interpretation of their response by the clinician or anyone else [16]. PRO allows you to evaluate the symptoms of the disease, the patient's health status, its functionality in everyday life, psychological well-being, health-related quality of life, satisfaction with treatment, as well as track their dynamics [17]. Scales and questionnaires are typical tools for assessing these parameters.

The ultimate goal of using scales and questionnaires is to compare the results of conservative treatment, predict surgical outcomes, identify risk groups, and adequately select patients [18].

The availability of generally accepted and accessible methods for assessing BP is very important, both in clinical practice and in research. Currently, there is no unified approach to the use of PRO in our country, although this would help to standardize and unify the study of various aspects of the problem of acute and chronic BP [19]. To determine the possibility of developing a standardized methodological approach to the diagnosis of BP in adult patients, the most commonly used domestic and foreign scales and questionnaires were summarized, and their advantages and disadvantages were highlighted. Unification of the criteria for research in the field of vertebroneurology according to the specified questionnaires and scales can make it possible to modify the existing standards for diagnosing and monitoring the dynamics of the course of BP, which can facilitate the continuity of patient management at the outpatient and inpatient levels of general medical and specialized neurological care [20].

**Objective**

The main purpose of the study to summarize information about the most common foreign and domestic scales and questionnaires used in acute and chronic BP in adults.

**Materials and Methods**

We searched for full-text publications in Russian and English in the e-Library, PubMed, Oxford Press, Clinical Keys, Springer, Elsevier, Google Scholar databases using keywords and combined word search (patient outcome assessment, vertebrogenic pain syndrome, pain in back, scale, questionnaire) for 2016-2021 using "Preferred Reporting Items for Systematic Reviews and Meta-Analyses" (PRISMA) standard. In addition, earlier publications of historical interest were included in the review. Despite our extensive search of these commonly used databases and search terms, it cannot be ruled out that some publications may have been overlooked.

## Results

For the diagnosis of BP in patients and dynamic monitoring of its course, standardized methods are used, such as: collection of complaints, anamnesis, objective examination, assessment of neurological status, laboratory and instrumental methods. Also, at present, there are many valid scales and questionnaires (Table 1) that can help assess various aspects of the course of BP and its outcomes. However, at present there is no single protocol for using a wide range of diagnostic scales and questionnaires for adult patients with BP in Russia and abroad, which makes it difficult to manage continuity in the management of this category of patients at the hospital and outpatient stages of health care.

**Table 1.** PRO tools used and promising for use in back pain.

| Group of scales and questionnaires | Name of scale or questionnairy |
|---|---|
| Scales and questionnaires for assessing pain characteristics in patients with back pain | Visual Analogue Scale<br>Numeric Rating Scale<br>Verbal Pain Rating Scale<br>The Faces Pain Scale and modified Faces Pain Scale<br>McGill Pain Questionnaire – 2<br>Neuropathic Pain Symptom Inventory<br>The pain DETECT questionnaire<br>Pain Quality Assessment Scale and Pain Quality Assessment Scale Revised<br>Douleur Neuropathique en 4 Questions<br>The Patient Assessment for Low Back Pain – Symptoms<br>Chronic pain grade questionnaire |
| Scales and questionnaires for assessing disease outcome in patients with back pain | MacNab Scale<br>The Low-Back Outcome Scale<br>Nurick Scale<br>The Patient Satisfaction Scale |
| Scales and questionnaires for assessing disability in patients with back pain | The Work Limitations Questionnaire<br>Prolo Scale<br>Orebro Musculoskeletal Pain Questionnaire |

### Scales and Questionnaires for Assessing Pain Characteristics in Patients with Back Pain

In vertebrology, the study of such a subjective symptom as pain is of great importance. When defining the criteria for a good treatment outcome, most neurologists agree that it is pain relief that determines it. The scales that clinicians use to assess back pain are in most cases one-

dimensional, i.e., measuring one specific parameter of pain, mainly its intensity. There are three main scales: the Verbal Pain Rating Scale (VRS), the Visual Analogue Pain Scale (VAS) and the Numerical Pain Rating Scale (NRS). The combination of the verbal and numeric rating scales gives the Verbal Numerical Pain Rating Scale (VNRS). These scales are classified as general or universal scales, i.e., used for a wide range of pain

syndromes. In clinical studies of BP, all three scales - VRS, VAS and NRS, as well as their combinations - are recommended for use as key measuring instruments [21].

*Visual Analogue Scale*

The Visual Analogue Scale (VAS) (Huskisson E. C., 1974) is a 10 cm long line with numbers from 0 (corresponding to the absence of pain) to 10 (unbearable pain). The patient is asked to mark a point on this line that corresponds to his feelings [1]. VAS is a handy tool available in both paper and electronic form. To fill out the paper version, you must have paper, a pencil and a ruler on hand; to fill in the electronic - a laptop, tablet or smartphone. The filling itself takes less than a minute. Other advantages of the scale are that it gives the researcher a wide range of possibilities, helps to assess the intensity of pain in different periods of time (over the last day; over the last week), at different stages of the disease (in exacerbation, in remission), etc.

The disadvantage of the scale is the only assessment parameter - the intensity of pain. The use of this scale is inappropriate when interviewed by phone, in patients with cognitive impairment, a significant decrease in vision. Also, there is still no consensus on what result of reducing the intensity of pain according to VAS in the process can be considered clinically significant. Despite this, this tool is widely used both in the practice of doctors and in clinical trials [22].

*Numeric Rating Scale*

The Numerical Rating Scale (NRS) is an ordinal scale on which, in ascending order, there are numbers that conditionally reflect the increase in pain intensity from the minimum value to the maximum. The 11-point NRS of pain contains numbers from 0 to 10 - 11 numbers in total. The number 0 corresponds to the descriptor "no pain"; The number 10 is a descriptor for "the worst pain imaginable." Numbers can be arranged on the same line by themselves; placed above a segment divided into 10 equal intervals by eleven vertical divisions or placed in a row of eleven cells [23].

The first version of the scale can be used in telephone surveys (inviting the respondent to rate the intensity of pain on a scale from 0 to 10 points), and the second and third options can be used in person. It takes less than a minute to fill the NRS pain.

The 11-point NRR of pain has good psychometric properties. She is sensitive to changes in the course of treatment. When evaluating the effectiveness of the treatment of pain in the lower back, a reduction in pain intensity of 2 points or 30% is considered clinically significant [24]. The rest of the limitations, in general, correspond to those of the VAS.

*Verbal Pain Rating Scale*

The verbal pain rating scale (VRS) was one of the first scales that psychologists began to use to assess the intensity of a symptom. VRS can also be used to assess pain.

VRS - a scale in which the intensity of pain is assessed using qualitative adjectives: no pain; the pain is mild; moderate; strong; the strongest you can imagine.

VRS has undoubted advantages - it is intuitive and its descriptors are well perceived by ear, including by patients with cognitive impairments.

Among the shortcomings of this tool, one can single out the lack of uniformity, since the “pain categories” can be either 5 or 10 or 15. The intervals of this scale may not be equal, which makes it difficult to compare VRS pain data with VAS or NRS. Also, VRS pain is less sensitive to changes in the course of treatment than VAS or NRS [22].

*The Faces Pain Scale and modified Faces Pain Scale*

The Facial Pain Scale (FPS) was created in 1990 by Bieri D. et al. The authors developed a scale to optimize the assessment of the intensity of pain in children, using the change in facial expression depending on the degree of pain experienced. The scale is represented by pictures of seven faces, with the first face having a neutral expression. The next six faces depict growing pain. It is necessary to choose the face that, according to the patient, best demonstrates the level of pain that he is experiencing [25]. Carl von Baeyer with students from the University of Saskatchewan (Canada), in collaboration with the Pain Research Unit, modified the FPS, which was called the modified facial pain scale. Instead of seven faces, the authors left six faces in their version of the scale, while maintaining a neutral facial expression. Each of the images presented in the scale received a digital score in the range from 0 to 10 points. The simplicity and ease of use of the scale make it possible for its wide clinical use in children. However, this scale can also be applied to persons with cognitive impairments in adult clinical practice [26].

The disadvantage of the scale is the limitation of the use of this scale in remote telephone counseling, in patients with significant visual impairment.

*McGill Pain Questionnaire – 2*

McGill Pain Questionnaire – 2 (MPQ-2) contains 15 pain descriptors, 7 neuropathic pain descriptors, and is provided with an 11-point NRS. The patient is asked to choose from a list of descriptors that convey sensations that correspond to his symptoms. To the right of each descriptor is an 11-point NRS, which allows you to assess the intensity of the symptom in points from 0 to 10. The absence of a symptom is indicated by 0 points. If the symptom is mild, the patient should note a number in the range from 1 to 3 points; moderate - from 4 to 6 points; strong - from 7 to 9 points, maximum - 10 points. The patient needs to allocate a number corresponding to the intensity of a symptom over the past week (in some cases, depending on the clinical situation, it is necessary to assess the intensity of symptoms at the current time, for example, over the last day). After the patient fills in the MPQ-2, the doctor sums up the number of points and gets an idea of the nature and intensity of the symptoms that disturb the patient [27].

The advantages of MPQ-2 have been shown by extensive clinical experience with its use. It is a reliable and valid way to quantify the conscious experience of pain by an individual patient. It can also help the clinician identify the specific type of pain syndrome, such as neuropathic, that the patient is suffering from [28].

The Russian version of the MPQ-2 was adapted according to the established rules, which reduces the possibility of errors to a minimum, and was also officially registered by the copyright holder - the Mapi Research Trust Institute and recommended for use in scientific research in the Russian Federation. However, the evaluation of its psychometric properties requires further research, which is its disadvantage for widespread implementation [27].

*Neuropathic Pain Symptom Inventory*

The Neuropathic Pain Symptom Inventory (NPSI) was developed to assess the symptoms of neuropathic pain and is based on the clinical experience of the authors and a review of the literature on the characteristics of pain most frequently identified by patients with various chronic pain syndromes [29]. NPSI is one of the most widely used tools for characterizing neuropathic pain symptom severity and has been validated in over 50 different languages. The questionnaire consists of 5 subscales, each of which represents different descriptions of neuropathic pain: spontaneous burning pain; spontaneous pressing pain; paroxysmal pain; caused pain; paresthesia/dysesthesia Each subscale is scored on an 11-point NRS (0 points = least pain, 10 points = most pain). The overall intensity

score is the sum of 10 descriptor points. Higher scores represent greater severity of the pain syndrome [30].

The advantages of the questionnaire are content validity, internal consistency, repeat test reliability, convergent validity, divergent validity, and sensitivity to changes in treatment.

The disadvantage is that NPSI is not a specific questionnaire for patients with BP [31].

*The Pain DETECT Questionnaire*

The pain DETECT questionnaire (PD-Q) was developed in 2004 in collaboration with the German Neuropathic Pain Research Network. The initial aim was to introduce quality management and improve the situation of patients with neuropathic pain in Germany. PD-Q proved to be an immediate success and was translated and approved in several languages [32]. The nine-item option includes seven questions about sensory sensitivity (burning, numbness, tingling, light touch, sudden onsets of pain, electric shock-like pain, sensation of heat/cold and light pressure), as well as questions about the dynamics of pain and its irradiation. The seven-item option includes only questions about sensory sensitivity [33]. The overall score is from 0 to 38 points, while a total score of less than 12 points is considered an indicator of nociceptive pain, 13-18 points - possible neuropathic pain, > 19 points corresponds to > 90% probability of neuropathic pain [34].

The advantages of the questionnaire are simplicity and reliability, the availability of a Russian-language version in free access [35], its practical orientation, because early detection of the neuropathic component of pain in patients with chronic pain syndrome is important for the correct selection of therapy. The questionnaire most fully reflects all possible parameters of pain and allows you to very clearly track the picture of the pain syndrome in dynamics [36].

The disadvantages of the questionnaire are that it is designed to be completed by a physician, is time consuming, and may not be understandable for patients with cognitive decline.

*Pain Quality Assessment Scale and Pain Quality Assessment Scale Revised*

Pain Quality Assessment Scale (PQAS) is one of the questionnaires used in clinical practice for self-completion by the patient. PQAS is derived from a scale called the Neuropathic Pain Scale (NPS). The NPS was developed to assess various pain qualities associated with neuropathic pain and is the first scale specifically designed for this purpose. The PQAS includes a 20-item overall assessment of pain severity and associated discomfort, two spatial aspects of pain, and 16 different pain qualities. For each item, the NRS is used, where 0 = no pain and 10 = the worst pain imaginable [37]. As mentioned above, pain is assessed using two global domains (intensity of pain and discomfort caused by it), two spatial domains (deep or superficial), and 16 qualitative domains (acute, hot, poorly localized, cold, sensitive as a fresh wound, like a mosquito bite, stinging pain, numbness, electric shock, tingling, convulsions, irradiation, knocking, "like a toothache" and like pressure). In addition, the PQAS also has an item that assesses the temporary nature of pain (intermittent, minimal pain all the time with periods of exacerbation and constant pain that does not change much from one moment to the next).

The advantage of this scale is that it can be useful for assessing both neuropathic and non-neuropathic pain; no need for outside help when filling out [38].

The disadvantages are the lack of a Russian-language version, and no information was found on the use of this measuring instrument in groups of patients with BP.

*Douleur Neuropathique en 4 Questions*

Douleur Neuropathique en 4 Questions (DN4) questionnaire was originally developed and approved in French, but was immediately translated into English by the same team. This questionnaire has been widely used in the diagnosis of neuropathic pain since

2005 due to its simplicity. It consists of 10 items and is intended to be completed by the clinician. Seven items related to the quality of pain (i.e., sensory and pain descriptors) are based on patient interviews, and 3 items are based on clinical examination. It includes components of how pain is felt by the patient, but also requires the examining healthcare professional to assess whether there is a decrease in sensation (hypoesthesia) to touch or prick and whether pain is aggravated or induced by light touch (allodynia). The DN4 questionnaire assesses neuropathic pain after central and peripheral neurological lesions. It is also used for diagnostic purposes, allowing the clinician to determine whether the pain is neuropathic in origin [39].

The advantage is the widespread use of the DN4 questionnaire in research and clinical practice, which simplifies the analysis of the data obtained during the survey, because. they are often found in the literature. Also, among the advantages can be noted the presence of many adapted versions of the questionnaire in various languages, the Russian version.

The disadvantages of this questionnaire are the need for face-to-face contact of the patient with a qualified specialist to assess the neurological status, as well as the fact that, according to the study by Epping et al. (2017), the use of the DN4 questionnaire as a standalone measurement tool in patients with suspected radiculopathy is not currently recommended. The combination of the DN4 questionnaire with PainDETECT proved to be the most suitable for screening neuropathic pain in this group [40].

*The Patient Assessment for Low Back Pain - Symptoms*

The Patient Assessment for Low Back Pain - Symptoms (PAL-S) was developed to take into account patient feedback on the benefits of treatment in chronic low back pain studies. This is a relatively new questionnaire consisting of 14 items, each of which contains a characteristic of pain, the intensity of which over the past 7 days the patient should assess by NRS from 0 to 10 points [41].

The advantages of the questionnaire are its acceptable reliability and validity, according to preliminary estimates. The PAL-S was developed according to US FDA guidelines with patients from different cultures and reflects the specific pain symptoms associated with chronic lumbodynia, and is not a general measure of pain in general.

The disadvantages of this questionnaire are the absence of a Russian-language version, its orientation for use in clinical trials, and not in the practice of a doctor, and also the fact that some additional psychometric parameters of PAL-S still remain unexplored [42].

*Chronic Pain Grade Questionnaire*

Chronic pain grade questionnaire (CPGQ) was proposed in 1992 by English scientists Von Korff and Ormel J. et al. The developed scale can be effectively used to assess chronic pain syndrome of various etiologies [43,44]. The questionnaire includes 7 questions: 1-3 - evaluate the intensity of pain at the moment, as well as the worst and average pain over the past 6 months; 4th - evaluates the days of disability; 5-7th - assess the degree of disability (daily, social, work activity [45].

The advantage of the CPGQ is that it takes into account the duration of pain and its strength, as well as the impact of pain on daily activities, rest, and work during the last month, which makes it possible to give not only a quantitative, but also a qualitative assessment of pain.

The disadvantages of the questionnaire include the fact that CPGQ cannot be used to assess a single episode of pain.

**Scales and Questionnaires for Assessing Disease Outcome in Patients with Back Pain**

An important criterion for the outcome of treatment of BP is the "satisfaction" of the patient. There are many approaches to assessing patient satisfaction. Some questionnaires contain only a few general questions, while others consist of many different questions.

*MacNab Scale*

For a subjective assessment of the effectiveness of BP treatment, including surgical treatment, the MacNab scale, which was proposed in 1971 by professor of orthopedics Ian MacNab (Toronto, Canada) can be used [46,47].

On this scale, the patient evaluates the result of his treatment according to four criteria: excellent; good; satisfactory; unsatisfactory. A modified version of this scale is also used in clinical practice and scientific research. It differs in that each of the levels of patient satisfaction corresponds to the criteria: “excellent” corresponds to: no pain, no limitation of mobility, the ability to return to normal work and activities; "good" - rare non-radicular pain, relief of previous symptoms, ability to return to modified work; "satisfactory" - some improvement in functionality, disability or inability to work; "Unsatisfactory" - ongoing symptoms of nerve root involvement, repeated surgery at this level, regardless of the duration and frequency of postoperative follow-up. According to these criteria, the physician or researcher determines the outcome of treatment for the patient [45].

The advantages of this scale are brevity and ease of use, the presence of an electronic version, the presence of a Russified version. In addition, this scale was included in the Russian clinical guidelines on occupational lumbosacral radiculopathy for physicians and occupational medicine specialists of 2021 [47].

The disadvantages of the scale are the subjective nature of the assessment of the outcomes of BP from the patient's words. In addition, it is predominantly focused on the evaluation of non-pharmacotherapy, in the surgical treatment of spinal pathology.

*The Low-Back Outcome Scale*

The Low-Back Outcome Scale (LBOS) was published in "Spine" journal in 1992 by Professor Charles Greenough of Middlesbrough English Hospital in association with Professor Robert D. Fraser of the University of Adelaide, Australia. It is intended to assess the functional outcome of patients with low back pain [47,48].

This point scale allows to evaluate outcomes as: excellent; good; satisfactory; bad. The total score consists of an assessment of answers from 0 to 5 points to 13 questions about the intensity of pain in the lumbosacral region, ability to work, the possibility of active physical and daily activities [49].

The advantages of LBOS are that this scale covers many aspects of the life of a patient with pain in the lumbosacral region quite widely, and therefore it can be recommended for widespread use, which is reflected in the Russian clinical guidelines for occupational lumbosacral radiculopathy of 2021 [47].

The disadvantages of this scale are the lack of an electronic version, which could reduce the time spent on its use by a neurologist on an outpatient appointment and in a hospital.

*Nurick Scale*

Initially, the Nurick scale was developed to assess the functional state of patients with spinal cord compression at the cervical level in spondylosis [50]. This scale is also called the "Walking Difficulty Scale", as it assesses the patient's condition through his ability to walk, the severity of symptoms varies from 0 to 5 stages: 0 - signs of nerve root involvement without data on the pathology of the spinal cord; 1 - signs of pathology of the spinal cord, but there are no difficulties with walking; 2 - minor difficulties with walking, which do not interfere with full-time work; 3 - Difficulties with walking that prevent full-time work or all housework, but do not require assistance in walking; 4 - the ability to walk only with assistance or use special devices; 5 - the ability to move around only while sitting or being in bed.

In Russian clinical neurological practice, the Russian-language version of the modification of the Nurick scale is more often used, based on the assessment of the dynamics of the neurological status in patients with vertebrogenic BP in the postoperative period and includes 4 levels of assessment: 1 - complete regression of neurological symptoms; 2 - improvement of neurological symptoms; 3 - condition without changes in neurological symptoms; 4 - worsening of neurological symptoms [51].

The advantages of the scale are its brevity, the possibility of using it on an outpatient basis and in a hospital, both by neurologists and by neurosurgeons and orthopedists. The Russian-language modified version of the scale is included in the Russian clinical guidelines for the diagnosis and surgical treatment of spondylogenic cervical myelopathy of 2015 [52].

The disadvantages of the scale are that it is focused on assessing the functional state of the cervical, but not the lumbosacral, spine. In addition, it is focused mainly on assessing the outcomes of surgical rather than conservative treatment of BP, and therefore has not found wide application in neurological practice.

*The Patient Satisfaction Scale*

The scale was developed by Dr. Tatsuya Morita (2002, Japan) [53] to assess the satisfaction of patients with cancer, but can also be used in cases of BP. The scale contains questions covering the awareness of the treatment, the availability of emotional support and the actual assessment of the effectiveness of the treatment. The assessment is made in points and reflects, to a greater extent, "satisfaction" with the patient's service in the hospital [45,47].

The advantage of the scale is its simplicity and clarity.

The disadvantage of this scale is its subjectivity, for example: the patient can give a higher score, taking into account the attention of the attending physician to him, and not the outcome of the treatment. This can make it difficult to compare treatment outcomes across health facilities and physicians, even within the same health facility.

**Scales and Questionnaires for Assessing Disability in Patients with Back Pain**

Determination of the degree of incapacity for work is carried out by a specially created structure of the state - the Bureau of Medical and Social Expertise, which in its activities is guided by the laws and acts of the Russian Federation, as well as the International Classification of Functional Disorders, Life and Health.

The assessment of disability is important both in the analysis of economic costs and in the study of the impact of therapy on the quality of life and satisfaction with the results of both the patient himself and his employer and the attending physician. Professional status is recommended for assessment at the first visit to the doctor, as well as at the end of the rehabilitation course, while the time of disability and the duration of the recovery period, the disability group, if any, should be measured.

*The Work Limitations Questionnaire*

The Work Limitations Questionnaire (WLQ) was developed in 1994 but published by D. Lerner et al. only in 2001 [54]. The WLQ scale is designed to assess disability in chronic pain syndromes. It contains 24 items, combined into 4 subscales: "Time Management", which consists of 5 items that reflect difficulties in managing your schedule, meeting requirements; "Physical requests", consisting of 6 points, assesses the ability of the respondent to perform tasks assigned at work, using physical strength, movement, endurance, coordination and flexibility; "Mental-psychic requests" contains 9 items and reflects intellectual activity and social interactions at work; "Labor Productivity" contains 5 items that assess the reduction in the duration and quality of work.

Each of these subscales ranges from 0 (no restrictions in work) to 100 (restriction in work is permanent) points and reflects how much time the respondent was limited in labor activity over the past 2 weeks [45].

The advantage is the simplicity and free availability of WLQ for non-commercial applications, however, commercial users are charged.

The disadvantage is the subjectivity of disability assessment, which can be used by the patient to obtain material or non-material benefits.

*Prolo Scale*

The scale was developed by the neurosurgeon Donald James Prolo in 1986 (USA, California) [55]. Designed specifically for the study of patients undergoing spinal surgery with an assessment of: economic outcome - from the standpoint of disability, functional outcome - from the standpoint of the ability to engage in physical activity [47]. Depending on the number of points scored, the treatment outcomes can be divided into 4 groups: 9-10 points - an excellent result; 7-8 points - a good result; 5-6 points - satisfactory result; less than 4 points - poor result [56].

The scale has the advantage of being easy to use and useful for comparing large amounts of data from surgical studies conducted over time.

The disadvantage is the limitation of the use of this scale in conservative treatment. Also, despite the fact that several authors have demonstrated the sensitivity of the scale in a number of tests, no rigorously validated studies have been found in the current literature.

*Orebro Musculoskeletal Pain Questionnaire*

Orebro Musculoskeletal Pain Questionnaire (OMPQ) was developed by Linton and Hallden in 1998 [57]. The questionnaire is intended for patients whose pain syndrome affects their performance at work, has repeated periods of incapacity for work, or the patient is currently unable to work for a period of not more than 12 weeks. There are 21 assessed questions regarding attitudes and beliefs, behavior in response to pain, affect, perceptions of work, and daily activities. The patient can fill out this questionnaire independently 5 minutes before the appointment with the doctor [58].

A cut-off score of 105 and below was found to predict complete recovery with 95% accuracy, and 81% accuracy in predicting no disability due to illness over the next 6 months. With an accuracy of 67%, the presence of a long-term period of disability (30 days over the next 6 months) is predicted. A threshold score of 130 or higher makes it possible to identify with an accuracy of 86% those patients who will not be able to return to work [59].

The advantage of the OMPQ is that it helps the clinician implement interventions (including the use of activity programs based on cognitive behavioral strategies) to reduce the risk of pain-related long-term disability and disability [60].

The disadvantages are the subjectivity of the scale and the lack of an adapted version in Russian.

It should be taken into account that disability is the object of assessment not only of specially developed scales (such as WLQ), but also of an essential part of questionnaires for assessing the quality of life. For example, the SF-36 questionnaire contains questions about the limitation of work in the sections of role functioning. However, in general, the questionnaire does not directly reflect the degree of disability, but assesses the totality of opportunities for various types of activity [45].

## Discussion

The main aspect of the patient with BP, for the study of changes in which scales and questionnaires are used, is the "pain characteristics". This aspect can be the subject of study

in almost any pathology. Therefore, there are both universal scales that are appropriate to use for various diseases, and specialized ones that have been developed to assess certain conditions. The scales and questionnaires described above are currently used or may be used in the future in patients with BP.

**Conclusions**

The lack of a review that integrates and translates the results of research on measuring the psychometric properties of scales and questionnaires leaves clinicians and researchers no choice but to make decisions about the choice of pain measurement instrument based on their personal observation, the availability of the questionnaire, the recommendations of colleagues, etc. A systematic synthesis of a group of individual studies will provide information on the measurement properties of questionnaires in a wide range of BP conditions. This would provide a more reliable and evidence-based choice and use of these tools in practical and research settings in clinical vertebroneurology.

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